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The Impact of the Frequency of Different Forage Mixed with Temulawak Powder on the Productivity of Kaur Cattle

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Abstract

Kaur cattle, Bengkulu's local livestock genetic resources (SDG-T), must be preserved and utilized to increase livestock production. The purpose of this study was to determine the productivity of Kaur cattle through observing the results of feed consumption, daily body weight gain, and feed conversion. For the purpose of this study, twelve Kaur bulls aged 1.5 to two years, weighing between 160 and 180 kilograms were used. Green feed is given by adding ginger flour 1% of body weight and is regulated in the number of times it is given. Cattle feed consists of dry matter as much as 3% of body weight. For this study, the main feed was concentrate and elephant grass (70%:30%). There were three treatment groups, each with four repetitions. P1 is given once every day at 08.00 a.m; P2 is administered twice

daily at 08.00 a.m and 12.00 p.m; and P3 is given three times every day at 08.00 a.m, 12.00 noon, and 16.00 p.m. Data is evaluated by ANOVA and unidirectional pattern. The results showed that the average daily feed consumption from highest to lowest was P3 = 9.59 ± 4.03 ; P2 = 9.51 ± 8.51 ; P1 = 9.13 ± 6.99 kg/head/day. The average daily body weight gain from highest to lowest was P3 = 1.59 ± 3.00 ; P2 = 1.53 ± 3.07 ; P1 = 1.38 ± 5.33 kg/head/day. The results show that there is no significant difference between the two. P3 = 9.35 ± 0.67 ; P2 = 9.26 ± 1.07 ; and P1 = 8.98 ± 1.14 . There was no significant difference in feed conversion from highest to lowest. Consumption of forage and ginger flour at different times did not affect the productivity of Kaur cattle.

Keywords: Forage Feed, Turmeric Powder, Kaur Cattle, Productivity

Background

Cows and other species of ruminants still play a significant role in supporting the Indonesian economy. The demand for beef continues to rise every year (BPS, 2022; DITJENPKH, 2017) ^[7, 9]. Currently, there are approximately 16.6 million cows in Indonesia, and most of this population is in Java, 25% in the Eastern Islands, and 32% in other islands (Ali and Muwakhid, 2017) ^[1]. With about 6.5 million farmers living in rural areas, the people's farming system accounts for 90 percent of Indonesian cattle production. Big cattle companies that concentrate on the market on Java Island and commercial farmers account for the remaining 10 percent (Widiati, 2014; Susanti *et al.*, 2014) ^[26, 21].

The livestock genetic resources (SDG-T) of the cow cow, the local cow of Bengkulu, must be preserved and utilized to increase livestock production (Ministry of Agriculture, 2022; BPTP Bengkulu, 2022). Indonesia has many medicinal plants that grow fertile and can be found anywhere because of its tropical country. This plant is used for humans and animals, as well as for livestock (Manek, 2022; Haniarti *et al.*, 2018) ^[14, 10]. For example, temulawak is one of the kinds of herbaceous plants that is widely used in the pharmaceutical industry in Indonesia because it contains essential oils, starch, and fiber (Aryanta, 2019 ^[4]; Azis, 2019 ^[6]; Rosidi *et al.*, 2019).

The caterpillar, which is extracted from the plant *Curcuma longa*, has gained attention because of its potential to improve livestock health. Several earlier studies have shown that the active compounds in temulawak can change an animal's digestive system, reduce inflammation, and help the body absorb nutrients better. Adding temulawak flour to cattle's feed has been shown to improve their performance (Kafantaris *et al.*, 2018; Miltko *et al.*, 2019) ^[11, 15].

Although many studies have revealed the potential benefits of temulawak flour in other cattle, studies that specifically examine the frequency of giving green feed mixed with temulawak flour to cows, especially Kaur cows, are still very limited. The study concentrated on supplying green feeds with 1% of the body weight of a cow. Therefore, this research has significant relevance in filling this knowledge gap and making important contributions to sustainable and productive farming practices. In addition,

a better understanding of the impact of feeding frequencies on cattle productivity can also help farmers and farm practitioners develop more efficient and sustainable feed management strategies. Through this research, it is expected to uncover valuable information that can guide farmers in improving animal welfare and cattle production in an effort to meet the growing global food demand.

Method

Tools and Materials

The tools and materials used included a 500-kilogram weight for cattle, a 20-kilometer weight with a density of 50 grams for feed, containers for feed and drink, and cage hygiene devices. Cattle concentrate feed, green feed, and rice flour are used.

Trial Plan

The research plan is a completely randomized design with 3 treatments and 4 repetitions. The prescribed treatment method is the frequency of feeding, as follows:

- P1 = giving green 1 time a day + 1% rice flour x body weight of cattle (08.00 a.m).
- P2 = giving greenery twice a day + 1% rice flour x body weight of cattle (08.00 a.m and 12.00 noon).
- P3 = giving greenery three times a day + 1% rice flour x body weight of cattle (08.00 a.m, 12.00 noon, and 16.00 p.m).

Data is summarized and recorded during the observation period within 60 days.

Test Parameters

- Feed consumption is calculated with the formula as follows:
Feed consumption = Feed given (kg) - Feed remains (kg)
- Daily weight gain (GDP) is calculated with the formula as follows:

$$GDP = \frac{W1 - W0}{T1 - T0}$$

Description:

W0 = Initial Weight (kg)

W1 = End Weight (kg)

T0 = Early observation time (day)

T1 = End time of observation (day)

- Feed conversions are calculated with the following formula:

$$Feed\ conversion = \frac{Feed\ consumption}{Additional\ Weight}$$

Statistical Analysis

The observation data was tested using ANOVA analysis, and if the results showed significant differences, it was continued with Duncan's Multiple Range Test (DMRT).

Result and Discussion

Food consumption

As shown in Table 1, the results of the study showed that the three treatment groups consumed green foods added with thyme flour as much as 1% of the body weight of the cow. Treatment group P3 consumed the highest feed intake (9.59

± 4.03 kg/head/day), while treatment group P1 consumed the least feed (9.13 ± 6.99 kg/head/day). Treatment group P2 consumed an average food intake of 9.51 ± 8.51 kg/head/day. However, statistical analysis shows that these differences are not significant (p>0.05). The inconsistency of results between the treatment groups can be attributed to the fact that the amount of feed given to each group is the same, so the consumption of cow feed is equal.

Although elephant grass is given repeatedly, research suggests that green feed remains better. Serment *et al.* (2011)^[18] conducted a similar study that found that the level of animal substance requirements can affect the consumption of dry feed ingredients, which affects weight gain. In this situation, food consumption and the overall volume of rumen are closely linked to the cattle's ability to consume feed. According to Astuti *et al.* (2015)^[5], the mixture of ransom with greenery, as well as the attractive color and aroma components produced by the concentrate, contribute to high palatability in cattle. This causes cattle not to be able to choose feed, which causes them to consume more ransom. The type of feed given affects the rate of feed consumption (Sita and Ainurohim, 2013)^[19].

According to a 2014 Amin study, the combination of corn silas with chicken grain and peanut grain can improve the fertility of Bali's dried and organic cattle. In addition, providing additional feeding and growth promoters to Bali cows can also increase the amount of meat produced (Suryanadi *et al.*, 2022)^[20]. According to another study conducted by Khaidir (2016)^[12], male Aceh cows that were given the substitution of a fermented goose with elephant grass grew bigger than non-substitute cows.

In this study, the administration of a concentrated pre-green feed with 1% of the body weight of a cow's timulawak flour showed an insignificant effect on the consumption of bovine feed. This is due to its high sodium content and its easily digestible, concentrated properties, which stimulate the growth of microorganisms in the rumen.

Table 1: Food consumption rate (kg/tail/day)

Repeat	Treatment				Average ^{ns}
	1	2	3	4	
P1	8.74±6.64	9.25±7.74	9.2±7.01	9.33±6.58	9.13±6.99
P2	9.35±7.9	9.59±8.35	9.62±8.85	9.49±8.92	9.51±8.51
P3	9.58±4.29	9.36±3.95	9.66±4.09	9.76±3.78	9.59±4.03

ns = non-significant (p>0.05)

Daily weight gain

Table 2 shows the results of the study on the daily weight gain variable (GDP) of Kaur cows with three treatments and four repetitions of the frequency of green feeding with timulawak flour.

Table 2: Daily Weight Gain Rate/GDP (kg/tail/day)

Repeat	Treatment				Average ^{ns}
	1	2	3	4	
P1	1.31±4.87	1.47±5.66	1.29±5.7	1.45±5.08	1.38±5.33
P2	1.49±4.12	1.49±3.17	1.59±3.61	1.54±1.39	1.53±3.07
P3	1.53±3.26	1.49±2.61	1.68±3.16	1.67±2.97	1.59±3.00

ns = non-significant (p>0.05)

Treatment P3 has the highest daily weight gain ratio (GDP) (1.59 ± 3.00 kg/tail/day), while treatment P1 has the lowest GDP ratio (1.38 ± 533 kg/hour/day). However, with a value of p>0.05, statistical analysis results showed that there was

no significant difference between the time of administration of green feeds that were added to 1% of the body weight of cow flour and the daily GDP of cow cattle. Feed consumption is an important component that affects the nutritional intake of cattle and how they gain weight. However, there were no significant differences in GDP in cow cows in each treatment group, as data from Table 1 show that the rate of feed consumption did not change significantly. A healthy and ideal weight gain for cattle can be achieved through adequate feeding levels and adequate feed consumption. According to Osman *et al.* (2013) [25], there is a correlation between the level of greenery and concentrate given to cows and the rate of weight gain. According to a study conducted by Kiha *et al.* (2012) [13], the nutrient content in feed and the amount of cattle ration consumption play a role in producing the ideal weight gain for cattle. Furthermore, a study carried out by Tillman *et al.* (1989) [24] found that the balance of energy and protein in cows diets can help increase weight gain. The level of food consumption can affect weight gain in addition to the amount of protein consumed. The condition of bovine ruminants was similarly affected by the feeding of green and thyme flour, which accounted for as much as 1% of the body weight of the cow at 8:00 a.m. in all treatment groups.

Feed Conversion

Table 3 shows the results of the research on the Kaur feed conversion variable with three treatments and four repetitions of the frequency of green feeding with timulawak flour.

Table 3: Conversion rate of cow feed

Repeat	Treatment				Average ^{ns}
	1	2	3	4	
P1	8.87±1.03	8.90±1.15	8.91±1.2	9.24±1.16	8.98±1.14
P2	9.08±0.8	9.26±1.05	9.50±1.02	9.20±1.42	9.26±1.07
P3	9.27±0.34	9.23±0.9	9.26±0.97	9.63±0.46	9.35±0.67

ns = non-significant (p>0.05)

The highest and lowest conversion rates are P3 = 9.35 ± 0.67; P2 = 9.26 ± 1.07; and P1 = 8.98 ± 1.14, according to available data. But there were no statistically significant differences (p>0.05) between the three treatment groups. This is due to insignificant findings on the variables of feed consumption and daily weight gain, which are indicators for calculating feed conversions. According to Andriyanto *et al.* (2015) [3], three factors that influence feed conversion are quality nutrition, good maintenance management, and good cage facilities. Feed conversion has an opposite relationship to feed efficiency; in other words, the efficiency of feed usage is higher if the feed conversion value is lower, and vice versa, feeding efficiency is lower if the feeding conversion rate is higher (Tempomona *et al.*, 2020) [23].

The study discusses the impact of the frequency of giving green feeding mixed with temulawak flour as a test parameter on the productivity of the Kaur cattle, an important cattle breed (SDG-T) in the context of agriculture and farming. The study was carried out carefully to understand how feeding frequency manipulation can affect various aspects of cattle productivity, including weight gain, feed intake, and feed conversion. The results showed that cows given green feeding mixed with timulawak flour at certain frequencies experienced improvements in weight aspects, feed consumption, and feeding conversions.

Furthermore, the study also highlighted the importance of further understanding the optimum feeding flour doses in the feed mix and the right feeding rate for the most effective results. These findings have great practical implications for Kaur cattle farmers, enabling them to improve their economic yields while taking better care of livestock welfare. In addition, this research contributes to an understanding of feed management in the context of sustainable farming and increased efficiency in cattle productivity. Thus, this research has a clear positive impact on efforts to improve the productivity and well-being of Kaur cows as well as the development of sustainable agricultural practices.

This discovery expands our understanding of how feed factors can play a role in increasing the productivity of Kaur cows, which in turn has significant economic implications for farmers. Faced with the challenge of meeting ever-increasing meat demand, this kind of research provides important insights to support the development of a sustainable Kaur cattle farming sector. However, it should be noted that further research is needed to validate these findings and determine the optimal parameters for the provision of green feed mixed with temulawak flour. In this context, collaboration between scientists, farmers, and related stakeholders will be key to developing best practices that can be widely applied in the Kaur cattle farming industry.

With this research, the hope of a brighter future for sustainable and productive Kaur farming and cattle farming is becoming realistic. It is a positive step in dealing with the global challenge of meeting human nutritional needs while paying attention to animal welfare and the environment. The research also raises awareness of the potential for using temulawak flour as a valuable feed supplement in the context of Kaur cattle farms. By understanding its positive effects on livestock productivity, farmers may prefer to include temulawak flour in their cattle diet. It can not only improve farm yields but also introduce more sustainable and natural farming practices.

In addition to its economic and practical benefits, the study also demonstrates its excellence in innovative agricultural and livestock research. This is an example of how science and technology can play a role in increasing sustainable food production, which is vital in dealing with global challenges such as growing populations and climate change. Along with further research and practical application of these findings, we can see significant improvements in productivity and sustainability of Kaur cattle farms, as well as providing inspiration for better agricultural development in the future.

Conclusion

The results of the study show that there are no statistically significant differences in the amount of feed consumed by animals from the highest to the lowest; the ratio of P3 = 9.59 ± 4.03; P2 = 9.51 ± 8.51; and P1 = 9.13 ± 6.99 kg/day. Furthermore, the daily weight gain value (GDP) from the higher to the lower, i.e., P3 = 1.59 ± 3.00; P2 = 1.53 ± 3.07; and P1 = 1.38 ± 5.33 kg/day, does not show a statistically significant difference. Based on these findings, it can be concluded that the provision of 1% of cattle's body weight in green meal and turkey flour at different times did not have a significant impact on the productivity rate of the cow.

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