Provision of Complete Feed Fermented Peel Cassava (Manihot esculenta Crantz) Male Kacang Goat Performance

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Abstract. Complete feed fermented cassava peel is a feed ingredient that is considered potential to support the performance of Male Kacang Goat. This research was conducted in Sihopuk Baru Village, Halongonan Timur District, Padang Lawas Utara Regency. Maintenance was carried out for three months, from April to June 2019. The research method was Completely Randomized Design (CRD) with 4 treatments and 3 replications so that there were 12 male goats maintained. P0: Complete feed 75% fermented cassava dried + 0% cassava peel, P1: complete feed 55% fermented cassava dried + 20% cassava peel, P2: complete feed fermentation 35% cassava dried + 40% cassava peel, P3: complete feed 15% fermented cassava dried + 60% cassava peel. The research parameters are Feed Consumption, Weight gain, and Feed Conversion. The average feed consumption of Kacang goat is P0 of 274.67; P1 of 277.64; P2 of 277.63; and P3 of 279.33. The average weight gain kacang goat is P0 of 12.70 g / head / day; P1 of 18.33 g / head / day; P2 of 34.66 g / head / day; and, P3 of 27.33 g / head / day. The average conversion of kacang goat feed is P0 of 21.98; P1 of 15.43; P2 of 8.38; and P3 of 10.23. P2 is a formula complete feed fermented cassava peel which is best for supporting the performance of kacang goats.

1. Introduction
Cassava peel is a waste resulting from the processing of food products made from cassava tubers. The availability of abundant cassava peel is a promising potential to make cassava peel as an alternative animal feed from waste. Besides the nutritional value found in cassava peel is quite good. Complete feed is a feed formulation technology that mixes all feed ingredients consisting of forages (agricultural waste) and concentrates which are mixed together without or just a little extra fresh grass. Complete feed is a balanced ration that is complete to meet the nutritional needs of livestock [1]. Utama and Mulyanto [2] stated that fermentation is a method of preserving biological agricultural waste by fermented organic acid products. With fermentation, the quality of nutrients in feed ingredients will increase. In addition, fermentation is also known to reduce anti-nutrient content, such as cyanide acid. Based on this, it is necessary to carry out research related to the provision of cassava skin-based complete feed fermentation in order to determine its effect on the performance of male kacang goats.

2. Ingredients and Methods
The study was conducted in Sihopuk Baru Village, Halongonan District, Padang Lawas Utara Regency, from April 2019 to June 2019.

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2.1. Tools and Materials

This study uses 12 individual cages with a size of 1 x 0.5 m² along with their equipment, feed containers, drinking containers, scales, trowels and tarps to mix and dry feed ingredients / concentrates.

The material used is 12 male kacang goats with 8kg-13kg body weight. Making complete feed using several materials including cassava peel, cassava dried, molasses, urea, minerals, soybean meal, rice bran and EM4. Drugs such as worm medicine (Kalbazen), anti bloat for bloating, drinking water, disinfectants (Rodalon).

2.2. Research methods

The study was conducted experimentally using a Completely Randomized Design (CRD) 4 treatments and 3 replications. As for the treatment given as follows: P0: Complete feed fermentation 75% cassava dried + 0% cassava peel, P1: complete feed fermentation 55% cassava dried + 20% cassava peel, P2: complete feed fermentation 35% cassava dried + 40% cassava peel, P3: complete feed fermentation 15% cassava dried + 60% cassava peel.

Table 1. Complete Feed Formulation Based Cassava Peel

| Material (%) | Treatment | P0 | P1 | P2 | P3 |
|--------------|-----------|----|----|----|----|
| Molasses     | 5         | 5  | 5  | 5  |    |
| Rice Bran    | 6         | 6  | 6  | 6  |    |
| Cassava Peel | 0         | 20 | 40 | 60 |    |
| Cassava Dried| 75        | 55 | 35 | 15 |    |
| Soybean Meal | 12        | 12 | 12 | 12 |    |
| Urea         | 1         | 1  | 1  | 1  |    |
| Mineral      | 1         | 1  | 1  | 1  |    |
| Total        | 100       | 100| 100| 100|    |

PK (%) 12,14 12,44 13,50 14,15
SK (%) 6,91 7,02 7,10 7,37
LK (%) 0,58 0,54 0,63 0,77
EM (kcal/kg) 2320,4 2392,8 2464,8 2536,8
TDN (kcal/kg) 64,15 66,16 68,15 70,14

2.3. Research Parameter

Average Daily Gain

\[ \text{ADG} = \frac{B - A}{L} \]

Note : B = final body weight
L = length of maintenance
A = initial body weight

Feed Consumption

Feed Consumption = feed given (g/head/day) – remaining feed (g/head/day)
Feed Conversion

\[
\text{Feed Conversion} = \frac{\text{Feed Conversion (g/head/day)}}{\text{Average Daily Gain (g/head/day)}}
\]

2.4. Research Implementation

2.4.1. Cage Preparation. The cage and all equipment are cleaned and washed, then sprayed with Rodalon (10 ml / 2.5 liters of water) on the floor and wall of the cage before the research process.

2.4.2. Goat Preparation. The goats used in this study were 12 animals consisting of 4 treatments and 3 repetitions, each experiment contained 1 goat. The placement of goats is carried out by a randomization system that does not differentiate the goat's body weight.

2.4.3. Feed Preparation. Making the Complete Feed (Complete Feed) the initial stage begins by weighing the feed ingredients according to the composition then the feed is spread on a tarpaulin and then mixed until homogeneous then moistened with Em4 mixed with water and molasses. Then put in a silo and finally closed so that the situation in the anaerobic silo. All feed ingredients that have been mixed into complete feeds are then fermented for 7 days.

2.4.4. Provision of feed and Drinking Water. The feed given is complete feed based on cassava peel fermentation according to the treatment: P0: Complete feed fermentation 75% cassava dried+ 0% cassava peel, P1: complete feed fermentation 55% cassava dried+ 20% cassava peel, P2: complete feed fermentation 35% cassava dried+ 40% cassava peel, P3: complete feed fermentation 15% cassava dried + 60% cassava peel, giving complete feed as much as 3% of the body weight of livestock.

Feed is given in the morning at 08.00 WIB and in the afternoon at 16.00 WIB. The rest of the feed is weighed in the morning the next day shortly before the livestock are fed again to find out the animal's consumption. Provision of drinking water is given in an ad libitum, water is replaced every day and the drinking water is washed clean.

2.4.5. Data Analysis. Data obtained and analyzed with Completely Randomized Design (CRD), if the data obtained are very real or real results then proceed with the Duncan test.

3. Result and Discussion

3.1. Feed Consumption

| Treatment | U1     | Repeat | U2     | U3     | Average |
|-----------|--------|--------|--------|--------|---------|
| P0        | 276,12 | U1     | 274,08 | 273,83 | 274,67b |
| P1        | 277,30 | U1     | 277,37 | 278,30 | 277,64a |
| P2        | 278,75 | U1     | 276,31 | 277,83 | 277,63a |
| P3        | 279,03 | U1     | 279,45 | 279,53 | 279,33a |

Note: Different superscripts on the same line show significantly different effects (P <0.05)

From the results of the study in table 3 can be seen the average consumption of each treatment P0 of 274.67; P1 of 277.64; P2 of 277.63; and P3 of 279.33 which is the lowest average consumption obtained at treatment P0 and the highest at P3.

The results of analysis of variance can be seen that the effect of cassava skin-based complete feed fermentation showed a significantly different effect (P <0.05) on feed consumption. The existence of
this significantly different effect indicates that the higher the level of cassava peel in complete fermented feed, the higher the feed consumption. It is suspected that differences in the type of feed or feed treatment is a factor that causes these real differences. Differences in the treatment of feed that make up the ration can lead to differences in palatability which ultimately leads to differences in the amount of feed consumed by livestock. Palatability is an important factor in determining the level of ration consumption [3] which will ultimately have an effect on livestock productivity.

Ensminger [4] explains the factors that affect palatability for ruminants are physical properties, (forage color brightness, taste, feed texture), nutrient content and chemical content of feed. The P2 ration produces the color and aroma that livestock like so that it has an impact on good palatability.

The energy content (TDN) in the feed also influences the level of feed consumption, namely the P3 TDN treatment is higher than in the P0, P1 and P2 treatments. This causes the consumption of feed in each treatment is different. This is consistent with the statement Perry et al [5] which states that feed consumption is influenced primarily by factors of feed quality and the energy requirements of the livestock concerned. The better the quality of the feed, the higher the consumption of feed from a livestock.

The more TDN content contained in feed, the more energy obtained by livestock to carry out physical and biological activities, this is very dependent on the physiological status of livestock to be used as a reference in the feed program. The amount of TDN that is in the feed is most likely to be digested into the nutrient components that are absorbed in the body.

3.2. Average Daily Gain

| Treatment | Repeat | Average |
|-----------|--------|---------|
|           | U1     | U2      | U3    |         |
| P0        | 11.11  | 12      | 15    | 12.70\(^c\) |
| P1        | 17     | 22      | 16    | 18.33\(^bc\) |
| P2        | 26     | 44      | 34    | 34.66\(^a\) |
| P3        | 26     | 29      | 27    | 27.33\(^ab\) |

Note: Different superscripts on the same line show significantly different effects (P <0.05).

From the results of the study in table 4, it can be seen that the average body weight gain of the goat nuts during the study were each treatment P0 of 12.70 g / head / day; P1 of 18.33 g / head / day; P2 of 34.66 g / head / day; P3 of 27.33 g / head / day, where the lowest average body weight gain was obtained in the P0 treatment and the highest was in P2.

The results of analysis of variance can be seen that the administration of complete feed fermented cassava skin based showed a significantly different effect (P <0.05) on body weight gain of goats. The existence of this significantly different effect shows that the increase in body weight of livestock is closely related to feed consumption. Livestock average daily gain is influenced by the quality and quantity of feed, this means the assessment of livestock average daily gain is proportional to the ration consumed [6]. ADG is a reflection of the quality of feed and water intake [7].

Hasan [8] states that the speed of growth is determined by the amount of nutrients intake and the amount of feed intake. This means that livestock will grow well and gain high body weight if the nutritional needs of livestock can be met, if the consumption of feed increases, it is suspected that the amount of nutrients consumed can meet livestock needs.

Alim [9] added that an important factor influencing ADG is feed consumption, the higher the amount of feed consumption consumed by livestock, the higher the rate of growth. ADG can occur if livestock are able to convert absorbed feed substances into animal products such as fat and meat after their basic needs are met.

Feed diets fermented with EM4 containing lignocellulotic microbes will help break lignocellulotic bonds, so that lignin and cellulose will be released from these bonds. Proteolytic microbes produce a
protase enzyme that will remodel proteins into polypeptides, subsequently into simple peptides and finally amino acids.

3.3. Feed Conversion

Table 4. Feed Conversion Data

| Treatment | Repeat | Average |
|-----------|--------|---------|
| P0        | U1     | 24.85   | 21.98a |
|           | U2     | 22.84   |        |
|           | U3     | 18.25   |        |
| P1        | 16.31  | 12.6    | 15.43b |
| P2        | 10.72  | 6.27    | 8.38c  |
| P3        | 10.73  | 9.63    | 10.23c |

Note: Different superscripts on the same line show significantly different effects (P <0.05).

From the results of the study in table 5 can be seen the average feed conversion of each treatment P0 of 21.98; P1 of 15.43; P2 of 8.38; and P3 10.23; which is the best average conversion obtained in P2 treatment and worst in treatment P0.

The results of analysis of variance can be seen that the administration of complete feed based on cassava peel showed a significantly different effect (P <0.05) on feed conversion. Conversion of significantly different feed is caused by the different body weight gain, different feed consumption, and different digestibility. This is consistent with the statement Hasan [8] which states that feed conversion is strongly influenced by the consumption of dry matter and ADG of livestock. Because conversion is the ratio between feed consumption and body weight gain.

The lowest feed conversion was obtained in P2 treatment, this shows that the complete feeding of cassava skin-based fermentation in P2 treatment was the most efficient feed. This is in accordance with the statement of Anggorodi [10] which states that the smallest feed conversion value is the most efficient feed. Feed conversion can be used to determine production efficiency because it is closely related to production costs, the lower the value of feed conversion, the higher the use of feed efficiency.

The highest feed conversion was obtained in the P0 treatment, this shows that feed quality also affects the conversion value, this is in accordance with the statement of Ensminger and Parker [11] which states that livestock that get feed with low energy and protein content in their feed will experience rapid growth. slow and have a lower feed efficiency compared to animals that are given a high energy and protein content.

Table 5. Recapitulation of the results of research on the provision of cassava skin-based complete feed fermentation on the performance of male goats

| Treatment | Feed Consumption (g/head/day) | Increase in Body Weight (g/head/day) | Feed Conversion |
|-----------|-------------------------------|-------------------------------------|-----------------|
| P0        | 274.67a ± 1.25                | 12.70a ± 2.03                      | 21.98a ± 3.83   |
| P1        | 277.64a ± 0.55                | 18.33a ± 3.21                      | 15.43b ± 2.51   |
| P2        | 277.63a ± 0.26                | 34.66a ± 9.01                      | 8.38a ± 2.23    |
| P3        | 279.33a ± 0.26                | 27.33ab ± 1.52                     | 10.23a ± 0.55   |

Note: Different superscripts on the same line show significantly different effects (P <0.05).

The results of the study of cassava peel-based complete feed fermentation showed significantly different effect (P <0.05), namely increasing feed consumption, increasing body weight gain and decreasing feed conversion, this was influenced by cassava skin processing which received complete fermented feed processing technology, thus increasing the nutritional value of feed and the nutritional value of feed can be absorbed properly in accordance with the nutritional needs of livestock.
4. Conclusion
Provision complete feed of cassava peel based fermentation to the performance of male kacang goats has a significantly different effect on increasing feed consumption, increasing average daily gain, and decreasing feed conversion. Based on the results of the study note that of the four treatments of ration with different levels of cassava peel, ration with 40% cassava peel level is the most optimal and efficient treatment.

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