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Consumption Value and Goat Livestock Weight Gain through Taiwanese Grass Feeding Using Morinda Bio-Activator Liquid Fertilizer

RAHMAWATI Semaun^{1,a,*}, JULIAWATI Rauf^{1,b}, Fitriani^{1,c},
 SYAMSUDDIN Hasan^{2,d} and BUDIMAN Nohong^{2,e}

¹Faculty Of Agricultural, Animal Husbandry And Fisheries, Univertas Muhammadiyah Parepare, South Sulawesi, Indonesia.

²Animal Husbandry Faculty Lecturer, Hasanuddin University, South Sulawesi, Indonesia.

^arahmapasca@yahoo.com, ^bjuli_mamuju@yahoo.co.id, ^cfitrianiisahidin@gmail.com,

^dSyam_Hasan@yahoo.com, ^ebudiman_ek58@yahoo.com

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Abstract. Concentrate is required to be added for forage feeding in order to meet nutritional needs and also to increase the productivity of goat livestock. This study was done gradually and continuously, starting from the making of liquid organic fertilizer with the addition of Morinda fruit bio-activator that used to cultivate Taiwan grass. Furthermore, the Taiwan grass is combined with concentrate to be given to goats every day at different treatment level. During the cultivation process, consumption and weight gain value are generated in goats. It can be concluded that the value of consumption and weight gain are not significant statistically. However, the best weight gain is obtained in K3 treatment with a value of 0.29 kg/day and it is also in line with the value of feed consumption in K3. Taiwan grass as initial feed and concentrate as additional feed in balancing level so that it can fulfill nutritional needs of goat livestock.

Introduction

The development of ruminant food industry must be supported by the availability of food sources, good quality, quantity and continuity throughout the year. Grass plant is one of forage feed source needed by ruminants (Hendarto and Suwarno, 2013), in addition the productivity is highly influenced by forage availability as a source of animal feed.

Woof is the important factor in animal husbandry sector. Giving woof with adequate nutrition to goat is hopefully able to improve productivity of goat. In Parepare, generally, goat breeders still use traditional way. They tend to feed to the goat malnourished woof. Therefore, expected productivity of goat is still low. Thus, the problem is how to improve the quality and quantity of goat production.

The woof is a very important factor in animal husbandry sector. Feeding with adequate nutrition to goats, is expected to increase the productivity of goats. In general, goat breeders, especially in the city of Pare Pare are still traditional. Feed given still sober and even still lacking nutrients. So the value of the desired productivity is still very difficult to achieve. For that, you need to do how to increase the value of forage productivity of both quality and quantity.

Woof is the important factor in animal husbandry sector. Giving woof with adequate nutrition to the goat is hopefully able to improve productivity of goat. In Parepare, Generally, goat breeders still use the traditional way. They tend range to feed to the goat malnourished woof. Therefore, the expected productivity of the goat is still low. Thus, the problem is how to improve the quality and quantity of goat production.

A way that can be done to improve forage productivity is fertilization, because fertilizer as a nutrient that must be given to plants, to grow and to reproduce well. Hasan, Budiman, Rasyid, and Sudarsono (2015) suggest that plant really needs a nutrient that has to balance so that can give maximal product and biomass and also susceptible to disease for the plant.

Fertilization can be done in 2 (two) ways, namely by using chemical fertilizers (inorganic) and organic. The chemical fertilizers in increasing forage production is undoubted. However, in recent years, serious concern has arisen about long-term adverse effects of continuous and

indiscriminate use of chemical fertilizer in intensive agriculture on the deterioration of soil structure and function and environmental pollution (Utamy *et.al*, 2018). Therefore, fertilizer producers, scientists and entrepreneurs tries to change the type of chemical fertilizers with other fertilizers such as organic fertilizer. The use of organic fertilizer is better and healthier. One alternative of organic fertilizer is liquid organic fertilizer. There are several ways that have developed in the making of organic fertilizer one of them by utilize natural bio-activator materials that source from abundant fruit waste such as Morinda fruit. A study using bio-activator materials of Morinda fruit waste in the making of liquid organic fertilizer by mixing cattle urine and then fermented with anaerobe for 7 days, and then sprayed onto Taiwan grass, its result is significant to the content of cellulose and lignin (Rauf, 2017)

The use of bio-activator noni liquid organic fertilizer dose of 15 cc in taiwan grass can lower lignin content. Decreased lignin content in forage Taiwan grass expected to improve the level of nutrient digestibility of Taiwan grass by goats. According Pasaribu and Praptiwi (2014) lignin is part of the wall that is difficult to digest. Its presence may hinder the process of digestion in cattle. Furthermore, the application of the goats by means of feeding forage Taiwan grass combined with concentrate, thus obtained value of consumption and body weight gain during the feeding Taiwan grass. According Yogantara (2014) that in an effort to meet the needs of the goats will nutrients in order to survive and produce well.

Material and Methods

This study is aimed to improve productivity of goat livestock after Taiwan grass feeding with liquid organic fertilizer and the addition of natural bio-activator of Morinda fruit waste.

This study was done gradually and continuously, starting from the making of liquid organic fertilizer with the addition of Morinda fruit bio-activator. The content of liquid organic is presented on Table 1. After that it is applied to Taiwan grass and obtained result that 15 cc treatment of fertilizer can reduce digested nutrient level.

Table 1. Analysis of pH, C-organic, N, C/N ratio, P and K

Sample Code	pH	C-Organic (%)	N (%)	C/N ratio (%)	P ₂ O ₅ (%)	K ₂ O (%)
Morinda + Cattle urine	5.04	1.30	1.84	0.71	2.29	2.5

Source: Laboratory test, 2017.

The next stage is the cultivation of Taiwan grass. In Taiwan, lawn maintenance process uses a less liquid organic fertilizer bio-activator. Taiwan lawn fertilization is done by:

1. Before the plants sprayed with a solution of liquid organic fertilizer bio-activator of noni fruit, the first 15 cc their liquid organic fertilizer diluted with water 1 liter.
2. Liquid organic fertilizer bio-activator solution of the noni fruit is sprayed on the whole plant, soil and around the plant roots.
3. Fertilization is done 2 times a week.
4. Plants watered every day in the morning and evening.
5. Defoliation on grass plants taiwan performed at 40 days
6. The results of this taiwan grass cultivation will be given to the goat every day.

Stages of livestock rearing goats. Goats first adapted for 2 weeks which aims to familiarize the animals are in cages and familiarize with the treatment of cattle feed given. Feed and water were given ad libitum in accordance with the treatment. The type of feed given is feeding Taiwan grass combination with various levels of administration concentrates on local goats. In this research

design Longitude Latin Cage (RBSL) consisting of 4 treatments and 4 replications. There are four levels of treatment in combination fodder Taiwan grass with various levels of administration concentrates to local livestock-goats, namely:

- K1 = Taiwan grass 95% + concentrate 5%
- K2 = Taiwan grass 90% + 10% concentrate
- K3 = Taiwan Grass 85% + 15% concentrate
- K4 = Taiwan grass 80% + 20% concentrate

During the cultivation process, the resulting consumption and weight gain values in goats.

a. Feed intake.

Feed intake was measured by calculating the difference between the amount (weight) ration given to the rest of the rations are not consumed. Measurements performed daily feed intake until the trial ends.

b. Body weight gain of livestock

Livestock body weight gain by calculating the difference between the initial weights with the final weight. Furthermore, daily weight increase can be determined by dividing the weight difference by the time of trial. Livestock weight was measured every single week in the morning before the cattle were fed and watered.

Result and Discussion

Feed Consumption

Value Added Consumption and Body Weight is an important parameter in the evaluation of feed because it influences on livestock production, while the results of research that includes an average feed consumption and body weight gain of goats are presented in Table 2.

Table 2. Average feed consumption of goats during research

Parameter	Treatment			
	K1	K2	K3	K4
Consumption (Kg/ekor/day)	6.51	7.27	7.73	7.55

Note: Different superscripts is insignificant ($P > 0.05$)

The consumption level is the amount of food consumed by animals given adlibitum. Feed intake greatly affects the productivity of livestock. One of the factors that affect the value of the livestock feed consumption is the quality and quantity of feed given to livestock. This feed consumption value is calculated daily by means of reduced amount of feed given to food remains.

Variance analysis indicate that the consumption value of goat livestock fed with different Taiwan grass and concentrate level did not significant ($P > 0.05$) on feed consumption. Average feed consumption of goat in treatment was 6.51 (K1), 7.27 (K2), 7.73 (K3), and 7.55 (K4). It can be said that the increasing level of Taiwan grass and concentrate has similar effect on feed consumption. The content of energy and protein of feed given is equal in each feed. According to Yogantara (2014) that as an effort to meet the nutrient requirement of goat to be survive and produce well, then the mixture of forage and concentrate must be given in a balanced dose.

The quality of a given forage greatly affect the value of feed intake of goats. The better the quality of the forage given value, the higher the feed intake of goats. Forage given to goats in this study are taiwan-quality grass, the result of cultivation using organic fertilizer liquid bio-activator of noni. Granting Taiwan forage grass combined with the concentrate is expected to meet basic living needs of goats.

Digestibility is one measure that is important to know the nutritional status of a feed. All the nutrients contained in food consumed by animals not everything is not all absorbed by the body of livestock. However, some will be issued in the form of feces. The absence of a real effect on the treatment of the level of consumption of goats was caused by giving the same ration to all livestock.

Feed intake is based on body weight is considered to be sufficient for basic living goats (Coal, et. Al., 2003).

In addition, no difference in the rate of consumption of feed combinations allegedly because grass and concentrates Taiwan has a fairly high level of palatability. The use of concentrate feed in the ration makes the feed has a high enough level of palatability is defined as a response to the feed given cattle. The level of feed intake reflects the feed palatability approach, namely the desire and joy to a feed livestock. A large amount of feed consumed by goats can describe the palatability of the feed value (David, et. Al. 2017). Van Soest (1994) stated that depends on the palatability of feed consumption, the amount of feed and environmental influences. Total feed intake is a determinant of the availability of nutrients for livestock feed. This will directly affect the level of livestock production. However, many factors can affect the level of feed intake in cattle feed goats like nature, environmental factors and factors of the animal itself.

Added Body Weight

Body weight gain of goats is one reflection of the quality of the feed given. The magnitude of the growth rate of goats is an overview of the level of feed utilization by the animal body is highly dependent on the quality of the feed given. Weight gain value can be seen in Table 3.

Table 3. Average weight gain of goats during research

Parameter	Treatment			
	K1	K2	K3	K4
Weight gain (Kg/ekor/Hari)	0.09	0.05	0.29	0.08

Note: Different superscripts is insignificant ($P > 0.05$)

Variance analysis indicate that the addition of various treatment for both Taiwan grass and concentrate did not significant ($P > 0.05$) to the weight gain. The average weight gain was 0.09 (K1), 0.05 (K2), 0.29 (K3) and 0.08 (K4). This data shows that weight gain is in line with feed consumption. It might the period of raising is very short i.e 14 days, hence it gives similar effect on weight gain in goats. Smith (2000) and Dzakuma et al. (2002) have conducted intake studies over longer periods of time, from weaning to yearling ages. Such measures of intake are needed, for different goat genotypes, in order for growth to be fully expressed and studied. Thus, a controlled experiment with purebred goats raised intensively was conducted.

A large amount of feed consumed by a goat is one of the important factors that greatly affect the level of productivity of goats. In this study, the best weight gain was in K3 treatment with a value of 0.29 kg/day when compared with K1, K2 and K4 treatments. These results are in line with the values shown on Table 3. Where, the highest values for feed consumption are T3 compared with other treatments. This means that the body weight is directly proportional to the value of livestock feed consumption, where the higher the feed intake, the higher the body weight of goats produced. It because the mixture of Taiwan grass and concentrate were equal so that it can meet the nutrient requirement of livestock. In addition, a high level of concentrate with a low level of forage provides weight gain, because the content of concentrate nutrient is quite good. According to Yogantara (2014) suggest that concentrate feeding needs to be applied in meeting nutritional requirement needs and to increase goat livestock productivity.

Body weight gain in goats is strongly influenced by the value of consumption and digestibility of feed given. Consumption value and digestibility of feed is influenced by the level of feed nutrients. Forage Taiwan grass by bio-activator liquid organic fertilizer can noni fruit can improve the nutritional value of feed, because it can degrade lignin content, thus improving nutrient digestibility level. This is in accordance with the opinion of Imsyai, et al (2014) revealed the Association of lignocellulose is a barrier in the utilization of feed ingredients in the ration because it will reduce the level of digestibility, thereby reducing the nutritional value of feed.

Feed digestibility in goats is affected by the number of microbes in the rumen. Crude fiber digestibility is closely linked. Plant cell walls consist mainly of cellulose and hemicellulose to be difficult to digest, especially when it contains lignin. Old plant typically contain high fiber

lignifikasi along with the addition of cellulose and hemicellulose in cell walls. Lignin is a part of the plant cell wall is difficult to digest. Lignin binds strongly with the hemicellulose and cellulose, lignin so that it can inhibit the digestibility of cellulose and hemicellulose. Katipana. et, all (2009) states affected by the digestibility of feed nutrient composition and digestibility are closely related to the content of crude fiber.

Food that has a high nutritional value and palatability good level, can quickly increase the weight gain of goats. In addition, the administration concentrates on the goat serves as a feed supplement that can boost the level of productivity of livestock, while primarily feeding on forage.

Important factors that could affect body weight gain of cattle are feed consumption. The higher the amount of feed consumed by cattle, the higher the growth rate. Live body weight gain occurs when cattle were able to change the feed substances are absorbed into livestock products, such as fat and meat after her basic needs are met (Ulfa, et.all., 2019).

Conclusion

The value of consumption and weight gain is not significant statistically. However, the best weight gain is K3 treatment with a value of 0.29 kg/day and it is in line with the value of feed consumption in K3. Taiwan grass and concentrate feeding are equal so that it can meet the nutritional requirement of goat livestock.

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