

Marica Goat's Response To The Provision of Superior Feed

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Abstract: Marica goat is an endemic local goat found only in South Sulawesi province. This kind of goat is one of the genotypes of goat originally from Indonesia. According to FAO report this kind of goat belongs to scarce category and is almost endangered. Marica goat has a genetic potential to adapt well in agro-ecosystem area of dry land that is in an annual very low rainfall area. Marica goat can survive at dry season although they feed only on hay in rocky land area. The aim of this study was to find out how marica goat responds to the provision of superior feed. The study was complete random design with 3 treatments and 3 cattle as replication. The treatment applied was the types of foliage provided: field grass (RL), superior grass (RU) and superior grass plus legume (RU+L). Marica goat used was growing female goat (research result Stage III). The pen used for intensive breeding was individual pen in the form of stage 1.5 x 1.5 m in size made of bamboo supplied with place to feed and place to drink. The results of the study indicate that marica goat had a good response to intensive breeding and provision of superior feed foliage at ex-situ condition. The provision of superior feed foliage at intensive breeding system gave response to body weight increase, feed consumption and efficiency of the use of marica goat's feed better compared to the provision of superior grass plus legume and field grass.

Keywords: Marica goat; superior feed

INTRODUCTION

Marica goat is a local endemic goat only found in South Sulawesi province. This kind of goat is one of the genotypes of goat originally from Indonesia. According to FAO report this kind of goat belongs to scarce category and is almost endangered. Marica goat has a genetic potential to adapt well in agro-ecosystem dry land area that is in very low annual rainfall area. Marica goat can survive at the dry season although they only feed on hay in rocky area. Marica goat population can be found in Maros regency, Jeneponto regency, Soppeng regency and around Makassar city in South Sulawesi province (Fitra, et al., 2009).

Research on the existence of marica goat population in South Sulawesi was still few including the number of population, capacity of population and density of population of marica goat in South Sulawesi is still very minimal so that the predicted number of marica goat population in South Sulawesi is still unknown.

The tracing result done by some cattle breeders indicates that the low population of marica goat at present was due to several factors. The most significant factor was generally marica goat was raised with kacang goat which is morphologically smaller than kacang goat. That's why cattle breeders did not pay much attention to the existence of marica goat and they tend not to raise them. The other factor is the competition to kacang goat in getting food is very low since the body of marica goat is smaller. Besides its low ability to survive in their habitat, especially during early birth due to the predators such as dogs and snakes. It was studied in this research how marica goat responds to the provision of superior feed, in order to know the provision of good feed for the sustainability of marica goat.

Characteristics of Marica Goat

In South Sulawesi there is a goat breeding similar to kacang goat called marica goat. The size is small compared to kacang goat and is hornless. The most specific characteristic of this goat is upright ears, relatively short and little horn, energetic and aggressive. Marica goat has genetic potential to adapt well in agro-ecosystem dry land area that

is in very low annual rainfall although they feed only on hay in rocky area. Marica goat population can be found in Maros regency, Jeneponto regency, Soppeng regency and around Makassar city in South Sulawesi province (Fitra et al., 2009). FAO reported that this kind of goat is almost endangered. The basic data on the productivity of marica goat are still few. Marica goat found in South Sulawesi has specific characteristics, that is upright and relatively small ears and the body is smaller than kacang goat.

The origin of this goat is still unknown for sure. This goat belongs to a special family. However, up to now this marica goat has not got serious attention from the community. Marica goat is a local variation of kacang goat. Marica goat found in South Sulawesi province is one of the genotypes of goat originally from Indonesia. According to FAO report this kind of goat belongs to scarce category and is almost endangered. The marica goat population can be found in Maros regency, Jeneponto regency, Soppeng regency and around Makassar city in South Sulawesi province. Marica goat has genetic potential to adapt well in agro-ecosystem dry land area in which annual rainfall is very low. Marica goat can survive at the dry season although they only feed on hay in rocky area. The most specific characteristic of this goat is upright ears and relatively small compared to kacang goat's ears. One of the characteristics of marica goat is short and little horn, energetic and aggressive compared to kacang goat.

Feed Consumption of Goat Breeding

Feed is edible stuff for the cattle, digested partly or wholly, absorbed and beneficial or does not disturb cattle health that feed it (Tillman et al., 1991; Kamal, 1994; Mc Donald et al., 2002).

The collection of feed done by the cattle both feed prepared by human and nature is called consumption. Feed consumption is an amount of feed that can be consumed by the cattle in a certain period and becomes the main factor determining the cattle response and the use of nutrient in the feed (Van Soest, 1994). At goat breeding, feed consumption is a complex activity comprising looking for feed, observing, movement, censoric activity, eating and digesting (Anonymous, 2007). The level of feed consumption is an amount of feed consumed by the cattle if the feed is provided *ad libitum* (Parakkasi, 1999; Nevy, 2004). The amount of feed consumption is the most important factor in determining the amount of feed substance available for the cattle which is further affecting the level of production (Van Soest, 1994).

The feed consumption of cattle is varied depending on the cattle species, body weight, body size, age, cattle condition, physiological status, condition and digestive system capacity, palatability of feed stuff and type of feed, energy content, availability of water and environment (Forbes, 1986; Ensminger, 1907; Tillman et al., 1991; Pond et al. 1995; Parakkasi, 1999; Nevy, 2004). Dry feed stuff consumption usually decreases by the increase of digestible feed substance content (NRC, 1981).

Goat has different eating habit with other ruminants and if it is not controlled will cause damage. Goat is able to eat very short grass and pull leaves which are not eaten by other cattle. Besides that, goat is a greedy eater with varied feed from plants, barks and cloths. The goat eating habit is very suitable in the area with low quality and quantity of feed such as in tropical area. With this eating habit, the goat can fulfill the basic feed substance for its body function better compared to other cattle species (Devendra and Burns, 1983).

Besides that, in consuming feed the goat has complex adaptable mechanism in handling the feed of high fiber.. The eating pattern of goat is also selective and tends to choose concentrate, for example one of the adaptive approaches. The eating pattern is able to increase nutrient concentration consumed without increasing the amount of feed consumption significantly which is limited by low digestive system capacity (Hoffman, 1988).

In order to know feed consumption of cattle, the amount of dry stuff that can be eaten by cattle for a day is necessary to know. By knowing the amount of dry stuff consumed, the need for cattle growth is fulfilled, its survival and production. Dry stuff is a yard stick to evaluate the feed palatability needed to determine the quality of feed (Lay et al., 2004; Anonymous, 2007).

RESEARCH METHOD

This research was experimental aimed at finding out the marica goat's response to the improvement of feed management and breeding system. The research was organized based on complete random design with 3 treatments and 3 cattle as replication. The treatment applied was types of foliage provided: field grass (RL), superior grass (RU) and superior grass plus legume (RU+L).

Marica goats used were growing female goats (data on research result Stage III). The pen for intensive breeding used was individual pen in the form of stage size 1.5 x 1.5 m made of bamboo and supplied with the place to eat and drink.

During breeding the cattle was provided with foliage consisted of natural grass, superior grass and superior grass plus legume. The provision of feed and drink during observation was done *ad-libitum* given in the morning and afternoon. The observation was done for 2 months preceded by habituating for 2 weeks.

The parameters observed were:

1. The increase of body weight; the observation was done based on the weighing of each cattle twice a week using digital scale.
2. Feed consumption; the amount of daily feed consumption calculated based on the amount of foliage provided subtracted with the remaining foliage which was not eaten at that day.
3. Efficiency of the use of feed (EPP); was calculated based on the formula:

$$EPP = \frac{\text{Increase of body weight}}{\text{Amount of feed consumption}} \times 100\%$$

Observation on marica goat's response to improvement of feed management and breeding system (ex-situ) was analyzed by using analysis of variance (ANOVA) based on complete random design with 3 treatments and 3 replications. If the difference was significant, it was continued by the smallest significant different test (BNT)

RESULTS AND DISCUSSION

The average increase of body weight of the marica goat as a response to the provision of different foliage during the research is presented in Figure 1 as follows:

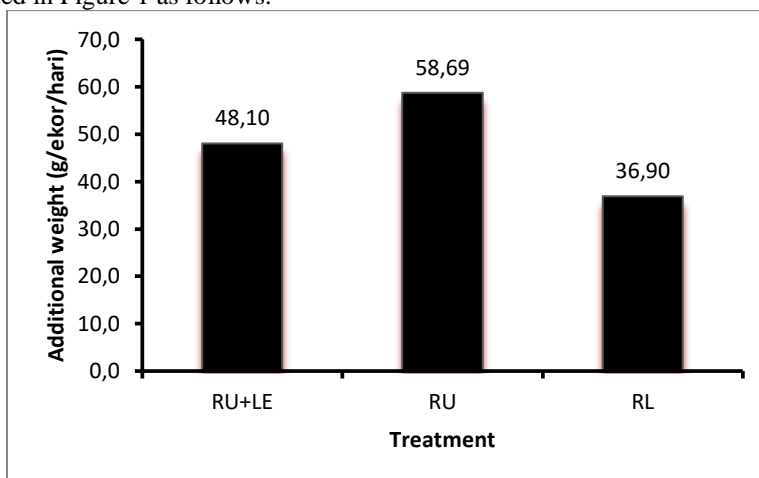


Figure 1. Average increase of body weight of the marica goat at the provision of different foliage

The analysis of variance indicates the provision of different foliage did not show any significant difference ($P > 0.05$) to the increase of body weight of the marica goat. The results indicate that the average increase of body weight obtained during the research was between 36.90 and 58.69 g/head/day with the increase of the highest body weight at the treatment of the provision of superior grass (RU) followed by the treatment of the provision mixture of superior grass and legume (RU + LE) and the increase of the lowest body weight was at the treatment of the provision of field grass (RL). This indicates that there was a tendency of marica goat to respond to a better growth in line with the improvement of foliage quality provided. The research result by Soenardjo et al. (1997) on kacang goat also indicates the increase of body weight was also affected very much by the provision of quality ration in which the good ration formula will affect the optimum growth. The average increase of body weight of marica goat obtained in this research was relatively low compared to several previous researches done on kacang goat, namely 66.31g/head/day (Martawidjaja et al., 2001) and 46 – 64 g/head/day (Ella et al., 2001).

Feed Consumption

The average foliage consumption of marica goat bred intensively during the research is presented in Figure 2. The analysis of variance indicates that the provision of different foliage affects significantly the amount of feed consumption of the marica goat ($P > 0.05$). The result of the smallest significant difference test indicates that the goat provided with superior grass (RU) and mixture of superior grass and legume (RU + LE) did not show a significant

difference. Whereas the feed consumption at the treatment of the provision of field grass (RL) was lower than the treatment of superior grass (RU) and mixture of superior grass and legume (RU + LE). This result indicates that marica goat has better palatability to the quality of superior foliage.

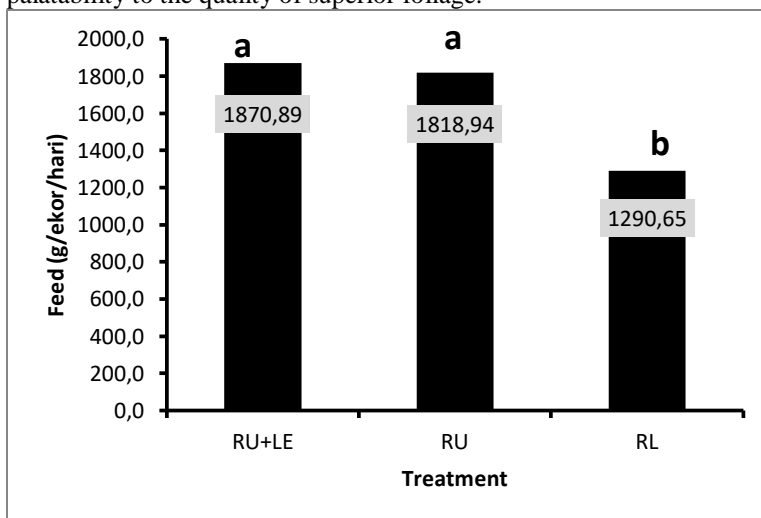


Figure 2. Average feed consumption of marica goat on the treatment of different foliage provision

The feed consumption obtained at this research was higher compared to the previous research on kacang goat with body weight 29.6 kg was 731 g/head/day. Feed consumption of cattle was fully affected by the goat condition during the research was conducted. If the goat is at growing condition, the consumption will be higher than the goat which is not growing. Besides that, the goat physiological condition during pregnancy and weaning will increase the need for ration (Devendra and Burns, 1994).

Efficiency of the Use of Feed

Feed efficiency is the amount of feed used by the goat body. The average feed efficiency at marica goat during the research is presented in Figure 3 as follows;

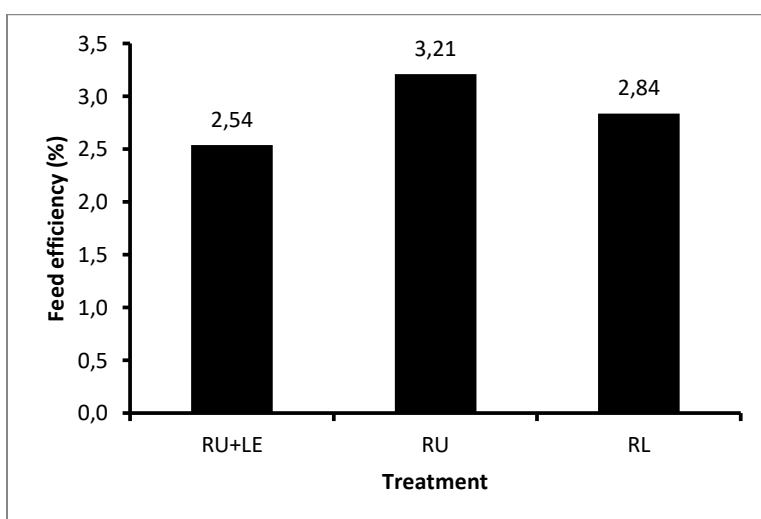


Figure 3. Average efficiency of feed use of marica goat at the treatment of different foliage provision.

Figure 3 shows the average lowest feed efficiency obtained at the treatment of the provision mixture of superior grass and legume was 2.54%, This was due to marica goat showing good palatability for mixture of feed between superior grass and legume whereas the ability of cattle to metabolism of feed consumed was low as indicated by the

increase of low body weight. Nevertheless, the result of the analysis of variance indicates that the provision of different foliage did not affect the efficiency of the use of feed in marica goat ($P>0.05$).

In this research efficiency of the use of feed in marica goat provided with different foliage ranges between 2.54 and 3.21. This figure is lower than the efficiency of the use of feed in angora goat (8.0%) and kasmir goat 12.6% (Jia et al., 1995). Further according to Simanihuruk (2005), efficiency of the use of feed in kacang goat consumed complete pellet feed was 11.5 – 14.4%. Low efficiency of the use of feed in this research was due to low body weight because the cattle were put in the pen with fixed foliage so that the goat was not free to choose foliage to consume and the need for the growth was not enough.

CONCLUSIONS

Based on the results and discussion, several conclusions can be drawn as follows:

1. Marica goat gives good response to intensive breeding and provision of superior foliage at *ex-situ* condition.
2. The provision of superior foliage at intensive breeding system gives response to the increase of body weight, feed consumption and efficiency of better use of feed to marica goat compared to the provision of superior grass plus legume and field grass.

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