

MANGROVE AND ITS EFFECT ON THE DEVELOPMENT OF SMALL RUMINANTS IN THE COASTAL AREAS

Didiek Rahmadi

Faculty of Animal Science, Diponegoro University

ABSTRACT

Mangrove has as an important role in the coastal area. Thus, it must be managed properly. An experiment on its management was carried out in Morodemak villages, Bonang subdistrict, Demak District, Central Java Province. Sheep owned by to the fisherman were used as a material of the experiment. These were taken using purposive random sampling method. Sample was chosen from three different locations. It was determined on the basis of the distance from farmer housing to the mangrove areas. It was divided into three categories, namely: close: 0-2 km; medium: 2-4 km; and distant: >4 km). Survey was done in order to collect data on mangrove, management system, and status of hematology (triglyceride and protein total of plasma blood) of sheep. The experiment was conducted by managing the sheep traditionally by giving them indigenous grass and leaf of mangrove. There was no difference in the content of triglyceride and protein total of plasma blood of sheep managed at three different areas. This phenomenon occurred due to only the quantity of leaf of mangrove, which has been fed to the sheep.

Key words: mangrove, sheep, triglyceride, and protein total of plasma blood

I. INTRODUCTION

Mangrove is mainly distributed throughout the coastal areas of tropical zones. Its habitat is located between the edge of high tide and close to the average surface of the sea. Its habitat is often called Payau, thus mangrove is identical to payau (Kertawinata, *et al.*, 1978). The ecosystem of mangrove is inhabited by specific flora and fauna and developed as a special environment called the coastal environment.

Mangrove must be managed properly. This is due to the fact that mangrove as a natural resource has been used by all strata of societies as a source of fuel, for tanning, and feedstuff (Rahmadi, 1985). Besides that, mangrove is very useful in protecting coastal areas from the waves and is useful as a nursery ground and feeding ground of fish and prawns (Martosubroto, 1978; Rahmadi, 1993). On the other hand, mangrove has functioned as an industrial production forest, as a means of protecting the

sea line and for preventing organic material and mud from rivers to flow into the sea. In Indonesia, the potential of mangrove is quite high, since it covers an area of 3,627,119 ha (Hendrarto, 1984).

Seventy percent of the people in the northern coastal areas of Java live in agricultural areas, and 60% of them live from the husbandry sector (Diponegoro University Team, 1978). Poultry and small ruminants such as sheep and goats are managed in the coastal areas. Small ruminants have a specific function, namely as a very important component in farmers' life (Devendra, 1985).

Sheep is one of a number of small ruminants that could be found everywhere in Indonesia (Reksohadiprodjo, 1984). They have contributed to the life of human beings, directly and indirectly. In Indonesia, sheep production could improve the welfare of poor farmers. The contribution of sheep and goats to farmers earnings constitute about 14 to 17% (Rahmadi, 1985).

The development of small ruminants, mainly sheep, depends on the feedstuff availability. It is, however, very limited, especially in the dry season. At that time, mangrove leaves become an alternative feedstuff that can be given to the animal in the coastal areas (Rahmadi, 1993). Mangrove has highly qualified nutrient value, as the content of protein, BETN, Fiber, Fat, and ash, are 12.20; 62.86; 4.49; 5.98; and 4.47%, respectively.

In conjunction with the function of mangrove, effort in maintaining of mangrove must be made through the multi-disciplinary approach in order to solve the problem of the decrease of the mangrove population. However, an

efficient method to solve this problem should be made available. This is very important, as mangrove has been uncontrollably exploited. On the other hand, effort is also needed to maintain the balance of environmental sources, edge value on the environment or feedstuff upon biomes.

On the basis of the information, evaluation on the nutrient status of small ruminants in mangrove areas and the relationships on the utilization of mangrove as a feedstuff must be done.

II. MATERIALS AND METHODS

Experiment was carried out in the Morodemak village, Bonang sub-district, Demak District, in the Province of Central Java. Sample was chosen using the *purposive random sampling method*. It was taken from three different locations. The locations were determined on the basis of the distance from the farmers' housing to the mangrove areas. It was divided into three categories, namely: close (0-2 km), medium (2-4 km), and distant (>4 km).

Survey was done in order to collect data on mangrove, management system, and status of hematology (triglyceride and protein total of plasma blood) of sheep. *One way completely randomized design* was used in the analysis throughout the experiment.

III. RESULTS AND DISCUSSIONS

The Demak Regency is located between 6°43'26" and 7°9'43" SA and 110°27'58" - 110°48'47" EL. The ave-

average wet days during the rainy season is 85.61 days with the average rainfall around 2,012.72 mm. Sheep population is 47,422 heads. Morodemak village is located in the coastal area with a total area around 371,041 ha. This area consists of 233,000 ha of pond and 138,041 ha of housing. About 46,78% of the population live as fishermen. Thus, small ruminants such as sheep are very important because they could be managed traditionally. Generally, sheep performance in Morodemak villages, Bonang subdistrict is good.

Sheep is managed traditionally without special pens. The walls of the pens were constructed from wood and bamboo. They are bound to the wall of farmer's housing. The floor of the animal's housing is dirt. Sheep is freely pastured, and feedstuff given as an *ad libitum*. This system indicated that

farmers depend on the natural feedstuff. It can be obtained directly from the natural pasture, from the bank of rice fields, and from pond areas. Thus, feedstuff must be collected throughout the year. Feedstuff is provided directly at the animal's pen. Devendra (Devendra, 1985) stated the animals preferred it this way and that they also preferred varied feedstuff.

Indigenous grass, leaf of *Leucaena leucocephala*, *Sesbania glandiflora*, and the leaf of mangrove are usually given as feedstuffs. Mangrove grows on both sides of the river. Besides, mangrove is planted on the bank of pond areas by farmers. Botanical composition at the mangrove areas in Morodemak villages consists of *Avicennia sp.*, *Rhizophora conjugata*, *Rhizophora mueronata*, *Bru-guera sp.*, and *Nypa frutican*. Biochemical analysis is shown in Table 1.

Table 1. Nutrient content of Mangrove Leaf

Mangrove	Crude Protein	Fiber	Crude fat	Ash	BETN
			%		
<i>Rhizophora conjugata</i>	12.20	4.49	5.98	4.47	62.68
<i>Rhizophora mueronata</i>	9.30	3.24	4.10	9.71	73.62
<i>Rhizophora mueronata</i>	6.19	1.90	2.76	32.08	57.08
<i>Avicennia sp</i>	5.82	2.60	3.15	16.12	72.51

The biochemical analysis (Table 1) shows that the crude protein and fat content of mangrove leaf is higher than that of indigenous grass.

Indication of forage quality can be seen from the composition of nutrient (Devendra, 1985). On the basis of the forage composition fed to the small

ruminant, it can be concluded that the average nutrient composition of crude protein, crude fat and fiber at the experimental location are 10.31; 4.07; and 13.71%, respectively. The result of hematology data of sheep is shown in Table 2.

Table 2. Hematology Status

Location	Triglyceride	Plasma Protein
	mg%	... g/ dl ...
Close	41.68	6.62
Medium	35.96	5.90
Distant	35.96	4.96

Variation analysis shows that there was no significant differences between the treatment on the content of triglyceride and protein total of plasma blood. This suggests that the amount of tannin on the mangrove leaf consumed by sheep is low. Sheep fed with mangrove leaves show no different effect in their content of triglyceride and protein total of plasma blood. However, results show the tendency of a higher content of triglyceride and protein total of plasma blood at the close location than at other locations.

This may due to the fact that at the close location sheep have been provided with more mangrove leaf compared to the others. The consumption of fat resulted increase as the consumed of mangrove leaf increased. This phenomenon affects the increase of triglyceride in blood. This occurred due to the absorption of fat by intestine

or heart. It is then distributed by blood as a *Chilimicron* from very low-density lipoprotein (Harper, 1980).

Leaf of mangrove also increases the consumption of protein. This is due to the higher content of protein in mangrove leaves compared to that in indigenous grass. Harper (1980) stated that there is a direct relationship between protein in feedstuff and protein in plasma. Feedstuff protein as a source of amino acid is used in the synthesis of the plasma protein.

IV. CONCLUSIONS

After the experiment, the following can be concluded :

1. Sheep in mangrove areas are traditionally managed. Thus, they still depend on natural resources (forage) for feed.
2. The content of triglyceride and protein of plasma blood of sheep in the mangrove areas was not affected by the distance between the mangrove areas and the farmers' housing .

AKNOWLEDGMENT

I wish to thank the Head and staff of the Livestock Agency of Demak district who had allowed us to conduct the experiment. I also like to thank Marry Christiyanto, Surono, and Syaefudin for their help throughout the experiment.

REFERENCES

- Devendra, C., 1985. Efficient Feeding Systems and Nutrient Requirements for Meat and Milk Production and Research in the Tropics. Proceedings of a Workshop held at The University of Queensland, Brisbane, Australia.
- Harper, H.A., 1980. Review of Physiological Chemistry. 15th ed. Lange Med. Pub. Los Altos, California.
- Hendrarto, B., 1984. Pengembangan Wilayah Pantai Ditinjau dari Segi Fisik dan Ekologi. Kursus Andal. Kerjasama Kanmen KLH-PPLH dengan Lembaga Penelitian Universitas Diponegoro, Semarang.
- Kertawinata, K., S. Adisoemarto, S. Soemodihardjo dan IGM Tantra., 1978. Status Pengetahuan Hutan Mangrove di Indonesia. Seminar Ekosistem Hutan Mangrove. LOM-LIPI.
- Martosubroto, P., 1978. Sumber Hutan Mangrove terhadap Perikanan. Sumber Ekosistem Hutan Mangrove. LOM-LIPI.
- Rahmadi, D., 1988. Evaluation of the Nutritional Status of Smallholder Goats in Upland and Lowland Areas, Central Java, Indonesia. Thesis. Tidak Dipublikasikan.
- Rahmadi, D., 1993. Hutan Mangrove sebagai Sumber Pakan Ternak. Disampaikan pada Seminar Mangrove. Semarang.
- Reksohadiprodjo, S., 1985. Padang Penggembalaan Ternak Ruminansia. Yogyakarta.
- Tim UNDIP, 1978. Base Line Study Masyarakat Berpenghasilan Rendah di Daerah Pantai Utara Jawa Tengah. Kerjasama UNDIP dan BAPEDDA Jawa Tengah.