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Effects of Traditional Medicine on Fat-Tailed Sheep's Performance

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ABSTRACT: Traditional medicine for livestock produced by PT. Air Mancur which is composed of *Languatis rhizoma* (25%), *Carica folium* (20%), *Santali lignum* (10%), *Andrographidis herba* (10%), *Sulfur crudum* (10%) and other ingredients (25%) was offered to fat-tailed sheep. Fifteen sheep were divided into three groups and were put in the individual metabolic cages. Each group was treated with 5 treatments, i.e. (A) without the medicine, (B) given one sachet of the medicine (2.14 g/kg $BW^{0.75}$/d) every day, (C) given one sachet of the medicine within three days, (D) given 1.5 sachets of the medicine (3.21 g/kg $BW^{0.75}$/d) every day, (E) given 1.5 sachets of the medicine within three days. The sheep were fed on basal diets of Guinea grass (*Panicum maximum*) and African star grass (*Cynodon plectostachyus*) mixed-hay *ad-libitum* and concentrate (1 % of body weight) twice a day. There was an interaction effect between level and frequency of offering the medicine on daily weight gain ($P<0.01$). There was no significant difference of feed consumption between treatments ($P>0.05$). However, there was significantly effect of the medicine on feed digestibility ($P<0.01$). Nitrogen retention was not affected ($P>0.05$), NH_3 concentration and microbial protein synthesis were increased ($P<0.01$) by offering the medicine. It was concluded that traditional medicine can be considered as defaunating agent to improve feed efficiency.

Keyword : Traditional Medicine, Fat-Tailed Sheep, Microbial Protein Synthesis.

Introduction

Traditional medicine is generally offered to livestock by small farmers in the villages of Indonesia. This aims to improve the animal health, feed intake and feed efficiency. The medicine which is composed of herbals is usually preserved either by the farmers themselves or by a medical factory.

Positive impact of offering the medicine on animal's performance has been recognized from long time ago. However, report on this, mainly on nutrition aspects, is still limited. Herbals contained in the medicine probably contains defaunating agent in the rumen. Thus, offering the medicine may improve availability of microbial protein flowing into the duodenum, especially for animals given low quality feed. As several authors reported that low population of protozoa in the rumen will improve microbial protein synthesis in the rumen which then flow into the small intestine made available for digestion and absorption.

In this report it is discussed the effect of the traditional medicine on nutritional aspects and performance of fat tailed sheep.

Materials and Methods

Fifteen male fat-tailed sheep (age 9-10 months, weight 13.29-19.31 kg) were allocated into Factorial randomized block design, three blocks and five treatments. The sheep were divided into three groups based on the initial body weight and put in the individual metabolic cages. Each group was treated with 5 treatments, i.e. (A) without the medicine, (B) given one sachet of the medicine (2.14 g/kg $BW^{0.75}$/d) every day, (C) given one sachet of the medicine within three days, (D) given 1.5 sachets of the medicine (3.21 g/kg $BW^{0.75}$/d) every day, (E) given 1.5 sachets of the medicine within three days. The medicine for livestock used was produced by PT. Air Mancur. It is composed of Languatis rhizoma (25%), *Carica folium* (20%), *Santali lignum* (10%), *Andrographidis herba* (10%), *Sulfur crudum* (10%) and other ingredients (25%). The medicine was offered per oral in the morning before feeding at level and frequency according to the treatments.

The sheep were fed on basal diets of Guinea grass (*Panicum maximum*) and African star grass

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(*Cynodon plectostachyus*) mixed-hay *ad-libitum* and concentrate (1 % of body weight) twice a day. Nutrient contents of the feeds was presented on Table 1. Two weeks before starting the experiment, the sheep were treated with deworming agent and adapted to the feed for 2 weeks adaptation period.

Data were collected within 8 weeks included feed intake, digestibility, nitrogen balance, purine derivatives, NH_3 concentration, protozoa population and daily weight gain. Purine derivatives to estimate microbial protein synthesis in the rumen was analyzed according to Chen and Gomes (1992) procedure. At the end of the experiment, sample of rumen liquid was orally taken to estimate NH_3 concentration and protozoa population.

Results and Discussion

The treatments, level and interval of the medicine offered to the animals did not affect feed intake (P>0.05). However, digestible OM intake was significantly affected as OM digestibility was increased by the treatments (Table 2). The increase of OM digestibility may be due to the difference of microbial composition in the rumen. High level and long interval of offering the medicine decreased population of protozoa in the rumen. As stated by several authors that low population of protozoa in the rumen will improve growth of other rumen microbes, mainly bacteria ones. On the other hand, low protozoa population will improve microbial protein synthesis in the rumen. Moreover, growth of rumen microbes other than protozoa is supported by high NH_3 concentration of rumen liquid. Rumen bacteria is very well known to use NH_3 as main nitrogen source for their growth (Satter and Roffler, 1981). A graph of NH_3 concentration, protozoa population and microbial protein synthesis is presented in Figure 1.

Table 1. Nutrient contents of feeds used in this experiment

Nutrients	Hay	Concentrate	Medicine
Dry matter (%)	85.00	84.82	88.31
Organic matter (% DM)	86.04	89.99	89.87
Crude protein (% DM)	9.72	17.04	8.71
NDF (% DM)	68.53	30.23	not analyzed

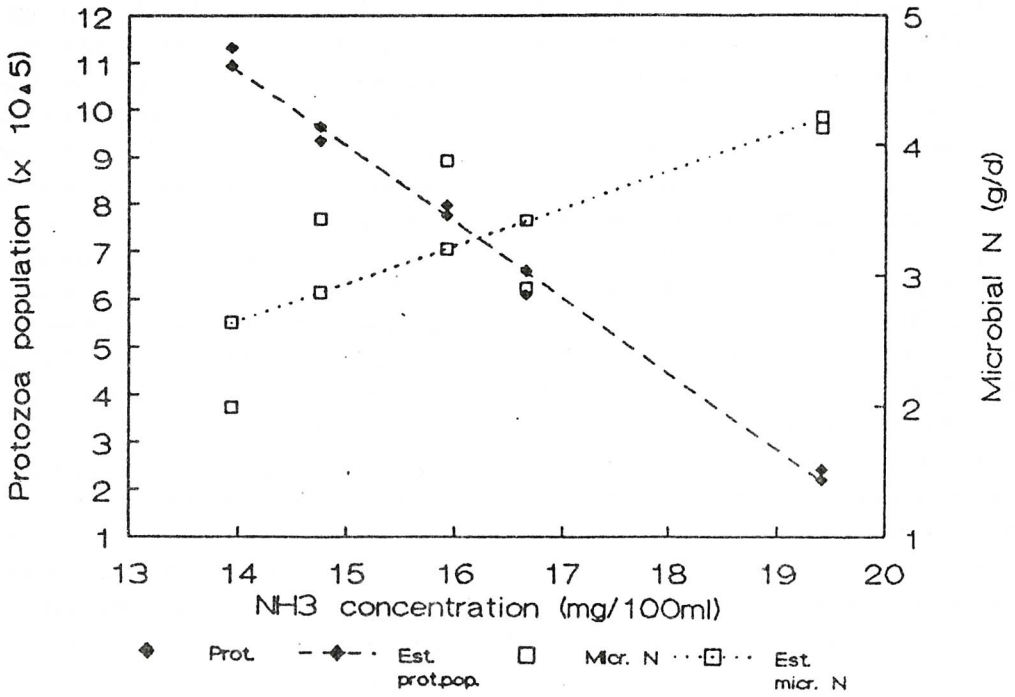

Figure 1. NH_3 concentration, protozoa population of rumen liquid and microbial N synthesis in the rumen of sheep treated with different level and frequency of medicine.

As presented in Table 2, although nitrogen intake was not affected, NH_3 concentration, however, was significantly affected by the medicine. It was showed in this research that there was no correlation between nitrogen intake and NH_3 concentration, there was positive correlation between microbial protein synthesis and NH_3 concentration ($r = 0.71$) and there was negative correlation ($r = -0.99$) between NH_3 concentration and protozoa population. Thus based on this data, the traditional medicine can be considered as defaunating agent in the rumen due to compounds contained in its ingredients. Decreasing in protozoa population in the rumen is probably caused by compounds of saponin, flavonoid and polifenol which exist on Languas galanga (Samsuhidayat and Hutapea, 1991), papain and androgafolid which exist on *Carica papaya* and *Andrographis paniculata*. The compounds are considered to have anti amoeba, virus and protozoa factors which hamper their growth (Esche, 1987). Intake level and frequency of these compounds by ruminant animals had effect on NH_3 concentration, population of protozoa, microbial protein synthesis and body weight gain. Based on data on this research, it can be concluded that offering the medicine at low level (one sachet) should be done every day, but at higher level it should be offered at longer period (1.5 sachets within three days).

Nitrogen and energy intake which is estimated from digestible OM intake was not significantly different between treatments ($P>0.05$). Consequently, nitrogen retention was also not significantly different. As stated by Broster and Oldham (1981) that nitrogen retention is a function of nitrogen and energy supply to the animals. Generally, nitrogen retention has positive correlation with body weight gain (Bines and Bach, 1973). However, this research showed that although nitrogen retention was not affected by the medicine ($P>0.05$) but not body weight gain ($P<0.01$). This might be due to a high of microbial growth other than protozoa which have a high contribution on feed degradation and protein supply for host animal.

Table 2. Effect of medicine on feed intake and digestibility.

Variables	Treatments				
	A	B	C	D	E
Intake (g/kg $BW^{0.75}$/d)					
- OM	53.62	53.30^{a}	54.74 ^{a}	51.85^{a}	54.43 ^{a}
- DOM	23.76	28.12^{a}	27.78 ^{a}	27.20^{a}	31.53 ^{a}
- N	1.30	1.34^{a}	1.35 ^{a}	1.34^{a}	1.34 ^{a}
Digestibility (%)					
- OM	44.38	52.78^{a}	50.75 ^{a}	52.45^{a}	57.96 ^{b}
N Retention (g/kg $BW^{0.75}$/d)	0.71	0.77^{a}	0.69 ^{a}	0.74^{a}	0.77 ^{a}
Body weight gain (g/head/d)	19.11	45.42^{a}	29.74 ^{b}	32.68^{b}	48.33 ^{a}
Microbial N synthesis (g/kg $BW^{0.75}$/d)	0.14	0.20^{a}	0.23 ^{ab}	0.27^{b}	0.27^{c}
Rumen liquid :					
- Protozoa (10^5/ml)	11.33	6.09 ^{a}	9.34^{b}	7.97^{a}	2.42^{c}
- NH^3 (mg/100ml)	13.94	16.66 ^{a}	14.76^{b}	15.92^{ab}	19.41^{c}

a-c : different superscripts on one line showed significantly different ($P<0.01$) between treatments, treatment A was not compared with other treatments

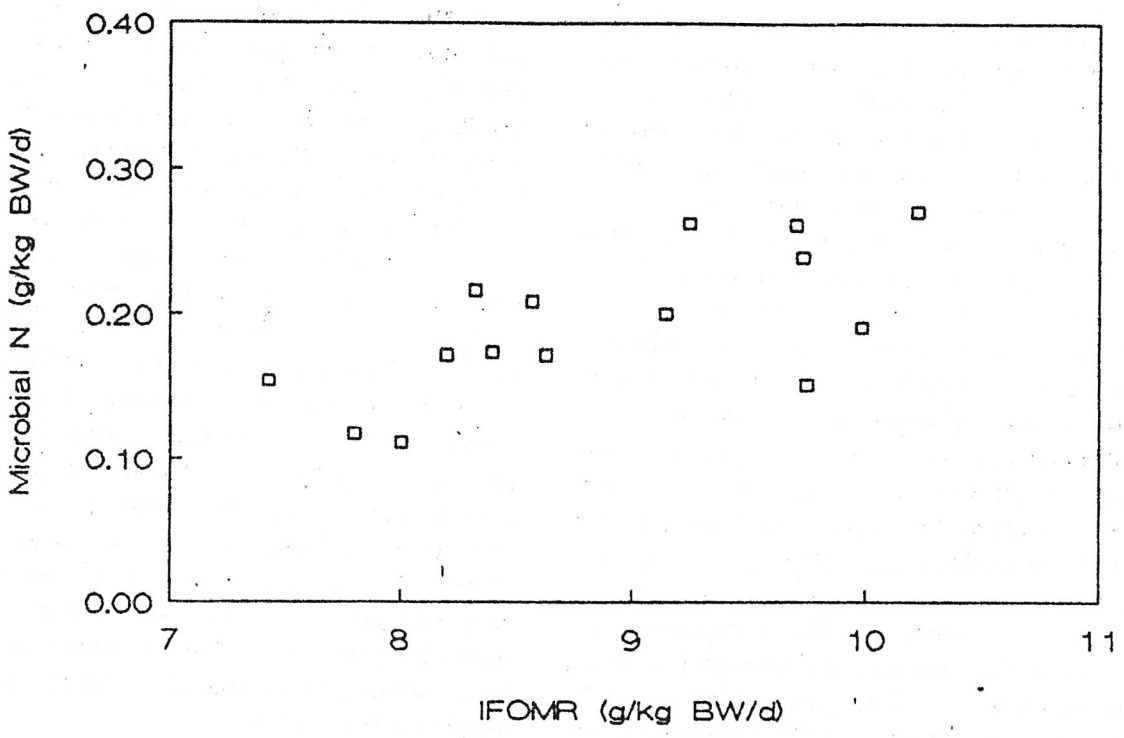

Figure 2. Correlation between intake of ruminally fermented organic matter (IFOMR) and microbial N synthesis

Rate of microbial protein synthesis does not fully depend on nitrogen intake, but it is more affected by NH_3 concentration in the rumen. NH_3 concentration can be used as an indicator of fermentation rate in the rumen. Therefore, to estimate efficiency of microbial protein synthesis should be based on intake of OM fermented in the rumen (IFOMR). As reported by Hagemester *et al.* (1991) efficiency of microbial protein synthesis in the rumen was relatively constant, i.e. 221 g CP/kg IFOMR or 35.36 g N microbes/kg IFOMR. If IFOMR is estimated as 65 % of OM intake, hence, mean efficiency of microbial protein synthesis in this research would be 22 g N microbes/kg IFOMR. IFOMR showed positive correlation with microbial protein synthesis, r = 0.67 (Figure 2). Although, Chen *et al.* (1992) stated that passage rate of digesta from the rumen cause a big variation in microbial protein synthesis efficiency.

Conclusion

Traditional medicine can be used as defaunating agent in the rumen. Microbial protein synthesis in the rumen was increased by offering the medicine.

Offering the traditional medicine at low level (one sachet) should be done every day, while at higher level it should be offered at longer period (1.5 sachets within three days).

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