THE EFFECT OF UREA MOLASSES BLOCK SUPPLEMENTATION ON THE PERFORMANCE, THE BLOOD AMMONIA AND GLUCOSE OF SHEEP

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SUMMARY

The experiment was conducted to study the effect of Urea Molasses Block (UMB) supplementation on the performance, the blood ammonia and glucose of sheep. Twelve male sheep on average one year old were used as experimental animals. They were randomly divided into four groups. Hence, each group consisted of three animals.

The four treatments applied were PO : control group fed on grass only, P1 : grass supplemented with UMB containing 3.6% of urea, P2 : grass supplemented with UMB containing 4.8% of urea, P 3 : grass supplemented with UMB containing 7.2% of urea. The treatments were arranged over the sheep according to Complete Randomized Design with 3 replicates.

The results of the experiment showed that UMB supplementation influenced ($P < 0.05$) the live weight gain, geed consumption and conversion, retention of nitrogen, blood ammonia and glucose of sheep.

It was concluded that UMB supplementation did not adversely affect the animal's health and yielded blood ammonia and glucose values in a normal range.

With regard to the performance of the sheep, the P3 group fed on grass supplemented with UMB containing 7.2% of Urea showed the highest performance.

INTRODUCTION

Now days the main point of the national subject in the sub-sector of cattle breeding is to provide feed to the cattle in a quantity and with a quality that can support growth sufficiently. The effort to improve sheep production is another way to partly solve animal protein needs for the Indonesia population. In addition to meat, sheep produce leather and woll.

In tropical area like Indonesia the forage crude protein content is low and on the other hand the fibre content is high. Thus, it cannot fulfill requirements for growth and reproduction (Gihad, 1976). In order to fulfill requirements for growth, sheep should not be fed for age only, but in addition supplements including protein, energy, mineral and vitamins sources. In addition, urea can be used as a feed supplement to improve sheep production. Until now cattle farmers used urea mainly, but the way of supplying this urea is not efficient.

Urea should be supplied at a correct dosage, because urea can be fatally poisonous. Urea may be supplied in the form of Urea Molasses Block (UMB) which consist of urea, molasses, corn meal, mineral and vitamin (Neric *et al.*, 1983; Hendratno, 1988).

MATERIAL AND METHODS

The experimental animals were twelve male sheep of an average age one year with 16.2 kg body weight. Next to the control condition 3 types of UMB were supplemented with a composition as presented in Table 1.

During the adaptation period, the animals were fed on grass. The design was a Complete Randomized Design with four treatments and three replications. One week after adaptation, the experimental aminals were randomly divided into four groups. Hence, each group consisted of three animals. The four treatments were PO, P1, P2 and P3. The sheep of the PO group were fed on grass only, P1 was fed grass supplemented with UMB containing 3.6% urea, P2 was fed grass supplemented with UMB containing 4.8% urea and P3 was fed grass supplemented with UMB containing 7.2% urea.

Table 1. Composition of Urea Molasses Block (UMB)

Ingredients (%)	P1	P2	P3
Urea	3.6	4.8	7.2
Mollases	35.0	35.0	35.0
Corn meal	56.4	55.2	52.8
Bentonite	2.0	2.0	2.0
Mineral mix	2.0	2.0	2.0
Calcium (CaO)	1.0	1.0	1.0

The UMB was supplied every morning. An hour before feeding grass each animal was given 100 gram UMB. The treatment covered two months (63 days). Animal body weight was measured once a week and the live weight gain was obtained by regression of the body weight of the sheep against time. Feed consumption was measured each day throughout the trial by measuring the differences between the amount of the feed given and the left over.

The feed convertion was obtained through regression of the cumulative feed consumption against the body weight of the sheep. The nitrogen retention data were collected in the third to fourth week of the trial by using Feeding Trial methods. Blood samples were collected at the onset and the end of the trial, four hours after UMB administration. In these samples ammonia and glucose were determined.

RESULTS AND DISCUSSION

Table 2 shows the average liveweight gain, and the feed consumption and conversion. Live wight gain, feed consumption and conversion were significantly different ($P < 0.05$) among the treatment groups.

By Duncan's Multiple Range Test it was shown that liveweight gain of P1, P2, and P3 were higher ($P < 0.05$) than of PO. The increase in liveweight gain was due to the UMB supplementation. Molasses may increase the available energy. This explains why the digestibility coefficient was increased.

Table 2. The average initial and final body weight, live weight gain, feed consumption and conversion of grass.

Subjects	Treatment			
	PO	P1	P2	P3
Intial body weight (kg)	16.3	16.0	16.2	16.2
Final body weight (kg)	18.2	18.3	18.7	19.0
Live weight gain (g/hd/d)	21.6	42.4	46.1	46.4
Feed consumption (kg/d)	0.953	0.510	0.509	0.541
Feed conversion	20.6	11.5	18.1	11.9

Basal feed consumption was decreased ($P < 0.05$) by UMB supplementation. Rumen microbial protein is needed to fuel growth (Leng *et al.*, 1986). By UMB supplementation extra energy and N are offered to support the synthesis of an increasing amount of microbial protein.

The feed conversion of PO was higher ($P < 0.05$) than of P1, P2, and P3. This means that UMB supplementation caused a decreased feed conversion of about 33%. This is most probably related to the increased protein deposition associated with the improved N retention. Degradation of fibrous matter is increased in association with rumen microbial activity (Haresign, 1981). It is therefore considered that animals supplemented with UMB digest the feed more efficiently. Table 3 shows the N consumption, N faecal, N urinary and N retention.

Tabel 3. The average retention of Nitrogen

Subjects	Treatment			
	PO	P1	P2	P3
Nitrogen consumption (g/d)	7.39	9.16	10.04	10.97
Faecal Nitrogen (g/d)	2.76	2.81	3.30	3.51
Urinary Nitrogen (g/d)	3.59	4.31	4.53	5.23
Nitrogen retention (g/d)	1.04	2.04	2.21	2.23

Retention of nitrogen was increased ($P < 0.05$) by UMB supplementation. However, the major part of the additional supplied N was excreted with the urine. Increasing the N retention is influenced by the energy value of the diet. The increasing energy value could be primarily responsible for the increased retention of N through the microbial protein synthesis in the rumen.

The blood ammonia and glucose are presented in Table 4.

Table 4. Blood ammonia and glucose

Subject	Treatment			
	PO	P1	P2	P3
The initial stage of blood ammonia (ug/dl)	104	107	109	105
The final stage of blood ammonia (ug/dl)	109	159	217	324
The initial stage of blood glucose (mg/dl)	55	61	59	56
The final stage of blood glucose (mg/dl)	61	66	70	79

Statistical analysis showed that blood ammonia and glucose differed significantly ($P < 0.05$) among the treatment groups. In the initial stage there was no significant difference ($P > 0.05$) of blood ammonia and glucose among treatment groups. In the final stage, the blood ammonia of P3 was the highest ($P < 0.05$). The range of blood ammonia in animals supplemented with UMB was 158 – 324 ug/dl. This range can be regarded as normal, because according to Goodrich (1976) the toxic level of blood ammonia in sheep is about 600 – 2250 ug/dl.

The experiment showed that UMB supplementation may increase blood glucose. The blood glucose of P3 was the highest ($P < 0.05$).

The normal range of blood glicose in sheep is about 54.5 ± mg/dl (Coles, 1986). The blood glucose of animals supplemented with UMB ranged 66 – 79 mg/dl. These increased levels can still be regarded as a normal condition, because according to Mitruka (1981) the blood glucose of male sheep ranged 43 – 100 mg/dl.

CONCLUSION

According to the results of the experiment it is concluded that UMB supplementation caused an improved performance of the sheep and did not adversely affect the animal health.

PENGARUH PEMBERIAN UREA MOLASSES BLOK DALAM RANSUM TERHADAP PERFORMAN, KADAR AMONIA DAN GLUKOSA DARAH DOMBA

ABSTRAK

Telah dilakukan penelitian tentang pengaruh pemberian Urea Mollases Blok (UMB) terhadap performan, kadar amonia dan kadar glukosa darah domba. Penelitian dilakukan selama dua bulan (63 hari). Sebagai hewan percobaan digunakan dua belas ekor domba jantan berumur sekitar satu tahun dengan berat badan rata-rata 16.67 kg.

Rancangan percobaan yang digunakan adalah rancangan acak lengkap. Secara acak domba dibagi menjadi empat kelompok masing-masing terdiri dari 3 ekor sebagai ulangan. Kelompok PO sebagai kontrol diberi makan rumput saja, kelompok P1 diberi makan rumput ditambah dengan UMB yang mengandung Urea 3.6%, kelompok P2 diberi makan rumput ditambah dengan UMB yang mengandung Urea 4.8%, dan kelompok P3 diberi makan rumput ditambah dengan UMB yang mengandung Urea 7.2%.

Hasil penelitian menunjukkan bahwa penambahan UMB mempengaruhi ($P < 0.05$) kenaikan berat badan, konsumsi dan konversi makanan, retensi nitrogen, kadar amonia dan kadar glukosa darah domba jantan.

Dari hasil penelitian ini dapat disimpulkan bahwa penambahan UMB tidak membahayakan kesehatan domba jantan, karena peningkatan kadar amonia maupun kadar glukosa masih dalam batas-batas normal.

Ditinjau dari performan domba, kelompok P3 yang diberi rumput dan penambahan UMB yang mengandung 7.2% Urea menunjukkan performan yang tertinggi.

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