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SHORT COMMUNICATION

FORMULATING MULTINUTRIENT FEED BLOCKS TOWARDS IMPROVING PRODUCTION AND REPRODUCTION OF DJALLONKÉ SHEEP

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In Cameroon, the sheep is an integral part of domestic livestock. However, its productivity in terms of growth and reproduction is very low because of poor nutritive quality of the available grasses especially during dry season[2,3,4,5], and (b) deficiency of some essential minerals are known to retard body growth and reproduction[6]. To optimise the production potential of the sheep, appropriate nitrogen and mineral supplementation is, therefore, necessary. Although several types of good quality nitrogen sources, such as concentrates, fish and meat meals etc. are available[4, 7, 8], these are very expensive and beyond the reach of the average Cameroonian farmer. Feed blocks based on agro-industrial wastes have been reported as cost-effective and excellent sources of nitrogen for supplementing feed in cattle and other domestic ruminants in several tropical countries[4, 9, 7, 8]. The objective of the present study was to develop a suitable Multinutrient feed block (MNB) using cheap agricultural by-products available in Cameroon and to evaluate the effects of their supplementation on the productive performance of Djallonké sheep.

The blocks were prepared using the formula proposed by Moujahed *et al.*[8] with slight modification. The composition was: Molasses (30%), Wheat bran (25%), Palm kernel (12%), Urea (10%), Cement (8%), Common Salt (7%), Bone meal (5%), White lime (2%) and Shell (1%).

All the dry ingredients were first mixed together and molasses was later added slowly while stirring the mixture. A small amount of water was added to obtain a semi solid paste. Once fully mixed, the paste was put into a wooden frame measuring 4x2x2 units. The material was force pressed into the slots by hands. Before putting the mixture into the wooden frame, a polyethene sheet was spread all over the frame, ensuring complete lining of the slots with it. The blocks formed were then removed from the frame and allowed to air dry for about a week. They were then enveloped with a polyethene sheet to avoid contamination / humidification during storage.

A simple and cheap mineral block was prepared as per Daget[10] using locally available ingredients. The composition was: Clay

(7.5%), Cement (7.5%), Common Salt (23.6%) and Bone meal (61.4%). All the dry ingredients were first ground and mixed uniformly. A small quantity of water was added gradually to make it semi-solid. The mixture was put in the polyethene lined wooden frame with slots of 4x2x2 and the blocks prepared the same way as UMMB. Both the UMMB and the MB were subjected to laboratory analysis for various nutrients according to Goering and Van Soest[11] and AOAC[12].

The study was carried out from July – October on 21 sheep divided into three groups of seven each. The animals were grouped uniformly according to body weight and the body condition score. The sheep were grazed on a mixed pasture of *Brachiaria ruziziensis* and *Pennisetum purpureum* during the day and housed at night in pens containing supplements. One block of UMMB (10 kg) was provided to the sheep in the first group while MB was provided to sheep in the second group. The third group was unsupplemented. The blocks were weighed at the end of each week and difference in weight was indicative of the quantity consumed per week.

Changes in body weight were recorded fortnightly from onset of the trial for three months. The total weight gained by the animals was calculated from the difference in their body weight at the start and the end of the study. Body condition score (BCS) of sheep in each group was taken at the end of the study. Data on body weight and body condition score was subjected to statistical analysis and comparison between groups was done[13].

There was no evidence of fungus growth on the blocks during a period of 12 months of storage. The chemical composition of the blocks is given in Table 1.

All the animals readily accepted the blocks offered to them. On average, the sheep consumed between 184 to 375 g of UMMB and 82 to 105 g of MB per animal, per day. The consumption of each block was on the

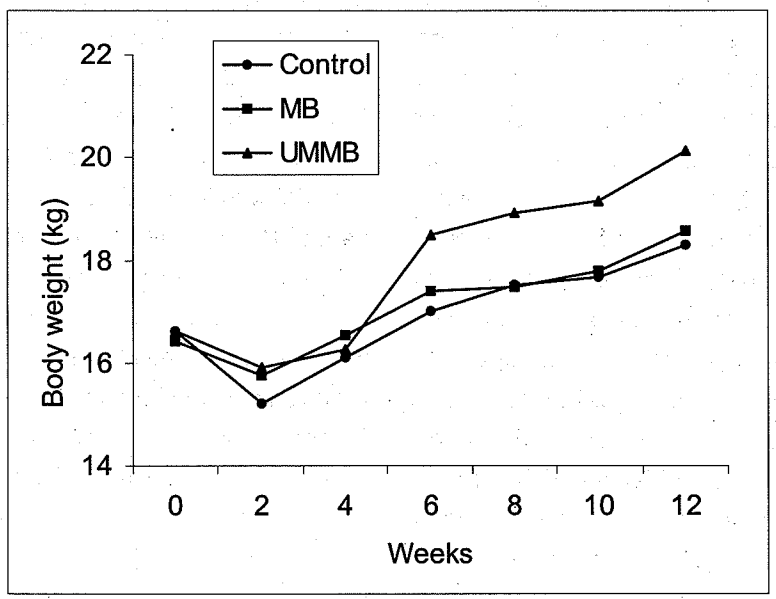

Figure 1: Body weight change of sheep with time during the trial.

Table 3: Chemical composition of the block supplements.

Blocks	Chemical composition (%DM)								
	OM	CP	Lipids	Ash	NDF	ADF	ADL	Cell	Hcell
UMMB	70.97	37.43	1.00	29.03	25.03	19.68	14.92	4.76	5.35
MB	5.49	0.47	-	94.51	-	-	-	-	-

DM: Dry Matter, OM: Organic Matter, CP: Crude Protein, NDF: Neutral Detergent Fibre, ADF: Acid Detergent Fibre, ADL: Acid Detergent Lignin, Cell: Cellulose, Hcell: Hemicellulose.

higher side in the beginning, which subsequently fluctuated inconsistently.

Changes in body weight of sheep in all the groups during the entire period of study are given in Figure 1. The sheep receiving UMMB supplement gained more weight than others but the differences were non-significant. The average daily weight gain during the study, however, was significantly higher ($P<0.001$) in the sheep receiving UMMB supplement as compared to the sheep receiving MB and control respectively (41.9±6.17 vs 25.23±7.86 vs 20.23±8.40 g/head/day). The BCS at the end of the study was significantly higher ($p<0.05$) in the UMMB (2.60±0.36) and the MB (2.39±0.43) supplemented groups than the control (1.77±0.50).

The blocks prepared in this study were of acceptable texture and taste as, sheep readily consumed them. Similar result was also reported earlier[4,7,9,14]. While the UMMB was rich in organic matter and crude protein ensuring nitrogen and energy to the animals, the MB contained only minerals. The sheep on UMMB supplementation gained significantly more weight ($P<0.05$) than those in the control group. The same result was reported earlier[14,15,16]. This could be the effect of additional nitrogen and minerals provided by the UMMB[17,16,14]. This can be explained by the fact that microbial growth efficiency in the rumen must have been enhanced by the presence of both urea and minerals whose deficiencies are widespread in the tropics.

The sheep receiving MB did not gain appreciably more body weight than controls. The trial was carried out during the rainy season, when pasture in grazing land is of reasonably good quality and could have been providing on average the required levels of minerals. Although the MB was a good source of minerals, it appears therefore that not the minerals alone, nitrogen and energy supplementation, as in UMMB, might be more beneficial in meeting the protein and energy requirements of the animals and in fully exploiting their genetic potential. Similar observations on the usefulness of the UMMB have also been reported in the past[7,9,14,16,18].

The production cost of UMMB was 107.5 frs CFA/ Kg. Each sheep consumed about 27 kg of UMMB over a trial period of 3 months costing 2 900 frs CFA. In turn, it gained about 1.8 kg more body weight, the market price of which is 4000 frs CFA. Accordingly, each sheep yielded additional benefit of 4000 frs CFA in lieu of 2900 frs CFA additional inputs. This resulted to a benefit of 1100 frs CFA, with a cost-benefit ratio of 1:1.4 in terms of weight gain alone.

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