

THE INFLUENCE OF FISH MEAL AND YELLOW MAIZE ON THE NUTRITIVE VALUE OF *THEMEDA TRIANDRA* FOR MERINO SHEEP

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The climax grass of the central Orange Free State is *Themeda triandra*. This grass has a low nitrogen content during the dry winter months. Due to its low intake by ruminants it is often unable to furnish a maintenance level of nitrogen. Supplementation of such pasture with nitrogen in the form of urea has not always proved satisfactory probably due to the sporadic intake of the lick by sheep (Lombard, 1965). However, in experiments at Glen and elsewhere (Kemmer & Coetzee, 1967; 1968) fish meal was found to be more palatable and to yield better results than urea. Therefore it was decided to use fish meal as a source of nitrogen in the present experiment and to compare it with maize which could furnish energy in addition to nitrogen.

Twenty four Merino wethers were fed chopped, low quality *T. triandra* hay *ad lib.* for a period of 30 days. Six sheep per treatment were given the following supplements:

1. Fish meal at a level of 0,667 g per kg live weight to furnish the total requirement for digestible nitrogen at the maintenance level (Elliott & Topps, 1964).
2. Fish meal at a level of 0,444 g per kg live weight to furnish the balance of the digestible nitrogen required for maintenance after provision has been made for the expected nitrogen intake on grass hay.
3. Yellow maize at a level of 3,51 g per kg live weight to furnish the same amount of digestible nitrogen as in treatment 2.
4. No supplementation.

Four sheep of each treatment group were subsequently used in a digestion and nitrogen balance trial for a period of 10 days. A salt-phosphate lick and fresh water were regularly supplied.

On analysis it was found that the nitrogen content of the *T. triandra* hay, fish meal and maize were 0,69 10,82 and 1,98 % respectively on a dry basis. The Relative Intakes (RI) of the sheep on hay alone and hay plus supplements as well as the Nutritive Value Index (NVI) of the complete ration were calculated (Crampton, Donefer &

Lloyd, 1960). These data as well as the nitrogen balance of the sheep are presented in Table 1.

Table 1

Relative Intake based on hay alone (RI_{hay}), hay plus supplement (RI_{TDM}), Nutritive Value Index (NVI) and Nitrogen balance of Merino sheep on T. triandra hay plus supplements

Supplement	RI _{hay}	RI _{TDM}	NVI	N-balance
	%	%		g/day
Fish meal (0,667 g/kg)	59 ^a	61 ^e	32 ^j	+ 1,90 ^y
Fish meal (0,444 g/kg)	57 ^a	59 ^{ef}	28 ^j	+ 1,24 ^y
Maize (3,51 g/kg)	40 ^b	52 ^f	27 ^j	+ 1,35 ^y
Hay alone	43 ^b	43 ^g	18 ^k	- 0,65 ^z

Figures in the same column bearing the same superscript do not differ significantly (P = 0,05)

Analysed according to the multiple range test of Student-Newman-Keul (Steel & Torrie, 1960).

It can be seen from Table 1 that the hay intake was increased by 37,2 and 31,6% over the supplemented group in treatments 1 and 2, respectively. It was noteworthy that supplementation with maize decreased hay intake by 7%. Supplementation with maize had a relatively large effect on the RI of the total dry matter (RI_{TDM}) as compared with fish meal supplementation.

The NVI as a measure of energy intake, reflects the influence of the supplements on the nutritive value of the complete rations. Supplementation with maize, low level fish meal and higher level fish meal increased the NVI of the hay by 50,0, 55,5 and 77,8% respectively. No statistically significant differences were found among the supplemented groups. The differences found between the NVI of hay alone and the supplemented hay were all statistically significant. Positive nitrogen balances were found in all supplemented groups. The differences between the un-supplemented and supplemented groups were statistically significant.

Valued at local prices, the daily supplementation of

the sheep with maize, high level fish meal and low level fish meal amounted to 0,59, 0,31 and 0,21 cents per sheep per day in this respective order. It can therefore be concluded that fish meal is a relatively economical supplement when given to sheep on abundant winter pasture. However, where pasture is scarce, maize may be used with good effect, especially when the aim should be conservation of pasture.

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