

Evaluation of crop residues
as feeds for goats. Part 1.
Voluntary intakes,
digestibility and nitrogen
utilization of groundnut
and bean haulms

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Groundnut and bean haulms were evaluated as feeds for indigenous Malawian goats. Generally, the results showed that the nutrients in the bean haulms were better digested and utilized by the goats than those in the groundnut haulms. However, provided that adequate amounts of both feeds are available, the goats can satisfy their requirements for dry matter intake and digestible crude protein.

Die moontlikheid om grondboontjie- en boontjiehooi te gebruik as voer vir die inheemse bokke van Malawi is ondersoek. In die algemeen het die resultate aangetoon dat die voedingstowwe in die boontjiehooi beter verteer en verbruik is deur die bokke as dié in die grondboontjiehooi. Indien daar egter voldoende hoeveelhede van albei voere beskikbaar is, kan die bokke hulle behoeftes vir die inname van droë materiaal en verteerbare ruproteïen bevredig.

Keywords: Malawian goats, voluntary intake, digestibility, nitrogen utilization, groundnut haulms, bean haulms

Introduction

Very little has been reported on the utilization of crop residues such as groundnut haulms and bean haulms by goats in the tropics. The objective of this study was to evaluate groundnut and bean haulms (stalks) as feeds for goats.

Materials and Methods

Four castrated male Malawian local goats weighing between 16,0 and 20,5 kg were used in a two-period cross-over design (2 × 20 days) to measure voluntary dry matter and free water intakes, nutrient digestibility and nitrogen utilization of groundnut haulms and bean haulms. The feeds were ground and fed *ad libitum* (Table 1) and water was freely available to the animals throughout the experiment. Analysis of the feeds and faeces were performed according to the AOAC (1975) methods.

Table 1 Chemical composition of groundnut haulms and bean haulms (on dry matter basis).

Nutrients	Groundnut haulms	Bean haulms
Dry matter (%)	94,47	92,26
Crude protein (%)	8,80	9,96
Crude fibre (%)	31,38	41,06
Ether extract (%)	0,33	1,35
Ash (%)	14,32	8,14
Nitrogen free extract %	45,17	39,49

Results and Discussion

The results are summarized in Table 2.

The dry matter contents of the feeds are relatively high and provided that adequate amounts of both feeds are available, the Malawian local goats can meet their requirements for dry matter intake and their maintenance requirement for digestible crude protein (Devendra, 1981; Reynolds, 1981) from groundnut haulms and bean haulms, respectively, as shown in Table 2. Generally, the results suggest that the nutrients in the bean haulms were better digested and utilized by the goats than those in the groundnut haulms. However, both feeds have some potential as

Table 2 Voluntary intakes, digestibility and nitrogen utilization of groundnut and bean haulms by goats

	Groundnut haulms	Beans haulms
Intakes (daily)		
Dry matter (g)	601,56	534,26 ^a
Free water (g)	1089,29	996,50 ^{NS}
Free water: Dry matter (g/g)	1,81	1,98 ^{NS}
Digestible crude protein (g/kgW ^{0.75})	2,79	3,70 ^c
Apparent digestibility (%)		
Dry matter	50,75	58,88 ^{NS}
Crude protein	45,41	57,01 ^c
Crude fibre	47,11	74,35 ^c
Ether extract	37,61	47,55 ^b
Nitrogen utilization (daily)		
Nitrogen intake(g)	8,47(0,97)	8,52(1,02) ^{NS}
Faecal nitrogen output(g)	4,59(0,52)	3,60(0,43) ^b
Urinary nitrogen output(g)	2,35(0,27)	1,53(0,18) ^c
Nitrogen retention(g)	1,53(0,18)	3,38(0,41) ^c

^{NS}, non-significant; ^a $P < 0,05$; ^b $P < 0,01$; ^c $P < 0,001$; Figures in parenthesis are values expressed as g/kgW^{0.75}

feeds for the goats in the tropics.

The high crude fibre digestibility (74,35%) for bean haulms is higher than the digestibilities for dry matter, crude protein and fat and may be a result of analytical error. Digestion coefficients recorded for bean haulms are more likely to be *ca.* 55% which would also be significantly higher than those obtained for groundnut haulms (47,1%).

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