Sorghum stover and lablab bean haulm as foods for lactating cattle in the agro-pastoral system of central Tanzania

A. J. Kitalyi¹ and E. Owen²

¹*Zonal Research and Training Centre, Mpwapwa, PO Box 202 Mpwapwa, Tanzania*

²*Department of Agriculture, University of Reading, Earley Gate, PO Box 236, Reading RG6 2AT*

Introduction

Surveys showed that the nutritional importance of milk in central Tanzania is tremendous but production is well below requirement. Food shortage in the dry season is the most limiting factor in milk production and crop residue is the major food resource. The research was designed to investigate the production and nutritional characteristics of sorghum and lablab residues as food for lactating cows.

Material and methods

Experiment 1

Mono stands of local sorghum (non bird-resistant) and lablab bean (twining, brown seeded) were established to produce residues for the feeding experiment. In a change-over trial with four 21-day periods, six Mpwapwa cows, weighing (M) 334 (s.e. 39.6) kg and offered stover (30 g dry matter (DM) per

kg M per day) were used to study the effect of lablab bean haulm feeding level (0, 7 or 14 g DM per kg M per day) on intake and milk production. The animals were given 0.5 kg DM maize bran per kg initial milk yield. Food offered and food refused were fractionated into botanical components to assess selectivity.

Experiment 2

In a plot experiment of randomized-block design the sorghum stover was cut at 0, 2 and 4 months after grain harvest. At each cut measurements were made of stover yield and quality. The harvesting dates represented early, mid and end of dry season, i.e. early July, early September and early November, respectively.

Experiment 3

With objectives similar to experiment 2, lablab bean was harvested at three dates. At each harvest yield of grain and haulm, and the characteristics of the haulm were measured.

Table 1 *Experiment 1: effect of lablab bean haulm feeding level (g dry matter per kg M per day)*

	Lablab bean haulm level (g DM per kg M per day)					
	0		7		14	
	Offer	Intake	Offer	Intake	Offer	Intake
Sorghum stover						
Stem	17.2	4.2	17.2	4.6	17.1	3.9
Leaf	6.2	5.9	6.2	5.7	6.2	5.8
Sheath	6.8	4.4	6.2	4.0	6.9	4.1
Lablab bean haulm						
Stem			5.1	3.7	10.1	7.0
Leaf			1.9	1.9	3.6	3.6
Milk yield (kg/day)	7.2		7.4		7.5	

Table 2 Experiment 2: effect of stover harvesting date

	Cutting dates (1990)				Significance
	5 July	7 Sept.	1 Nov.	s.e.d.	
Stover yield (t DM per ha)	8.5	6.6	6.6	0.96	
Stem (g DM per kg DM stover)	573	593	628	25.2	
Leaf (g DM per kg DM stover)	157	146	103	12.6	**
Sheath (g DM per kg DM stover)	161	151	173	18.9	
Stem nitrogen (g/kg DM)	5.9	5.7	5.4	0.44	
Leaf nitrogen (g/kg DM)	18.3	16.6	14.4	0.53	**
Leaf sheath nitrogen (g/kg DM)	8.6	8.0	8.3	0.36	
Organic matter digestibility					
Stem (g DOM per kg OM)	417	479	423	13.5	**
Leaf (g DOM per kg OM)	631	650	603	10.9	**
Sheath (g DOM per kg OM)	475	526	553	15.1	**

Table 3 Experiment 3: effect of harvesting date on lablab

	Cutting dates (1990)				Significance
	5 July	7 Sept.	1 Nov.	s.e.d.	
Grain (t DM per ha)	0.10	0.31	0.34	0.067	*
Haulm (t DM per ha)	5.3	2.9	2.8	0.66	*
Leaf drop (t DM per ha)	0.9	2.6	2.0	0.3	*
Stem (g DM per kg DM haulm)	682	849	785	20.5	**
Leaf (g DM per kg DM haulm)	274	76	31	30	**
Stem nitrogen (g/kg DM)	15.0	11.4	10.8	1.06	*
Leaf nitrogen (g/kg DM)	39.0	34.5	28.5	1.53	**
Organic matter digestibility					
Stem (g DOM per kg OM)	485	471	469	29.9	
Leaf (g DOM per kg OM)	648	672	601	24.4	

Results and discussion

The improved nutritive value of the sorghum stover at the second cut can be attributed to a tillering effect as previously shown by Ward, Perry, Smith and Schmitz (1979). The high leaf losses with delayed harvesting of the lablab bean haulm and the known higher nutritional value of the leaf, call for further research on harvesting time, handling and conservation techniques.

Acknowledgement

The authors wish to acknowledge sponsorship of the research by the International Development Research Centre (Canada) (IDRC)

Reference

Ward, J. K., Perry, L. J., Smith, D. H. and Schmitz, J. T. 1979. Forage composition and utilization of grain sorghum residue by beef cows. *Journal of Animal Science* **48**: 919-925.