Nutritive value of multipurpose tree and shrubs fed to cattle and goats in the highland areas of Tanzania

MN Shem, AE Kimambo, BH Jumbe

*Department of Animal Science and Production, Sokoine University of Agriculture,
PO Box 3004, Morogoro, Tanzania*

Samples of the different shrubs were collected from five districts in Kilimanjaro in Northern region from June 1988 to may 1989. Five bulk samples for each trees or shrub leaves were collected. Each bulk sample was obtained by mixing 20 samples of the tree or shrub leaves collected throughout the study period. The samples included those collected both during the wet and dry seasons.

The samples were analyzed according to AOAC (1980, Official methods of analysis, Washington DC) methods for dry matter (DM) and organic matter (OM). Crude protein (CP) for nitrogen (N) determination was analyzed by the Kjeldal method using a semi-automated N analyzer. Dry matter degradation DMD from nylon bags was determined according to the model described by Ørskov et al (1980, Trop Anim Prod, 5, 195-213). The data was then fitted to the mathematical model $p = a + b (1 - e^{-ct})$ (McDonald, 1981, J Agric Sci, 96, 251-252) where p is the percent degradation at time t ; a is the zero time intercept, b is the degradation constant, a + b is the potential degradability and c is the degradation rate constant. ME values were estimated from 48 h dry matter degradability (DMD 48).

Chemical analyses and *in sacco* degradability studies showed highly significant differences ($P<0.05$) in chemical composition and degradability constants. Dry matter (DM) values for the shrub and tree leaves significantly ($P<0.05$) varied between species, ranging from as low as 204 g/kg in *C. Macrostachyus* to 459 g/kg in *I.mitis*. Crude protein (CP) contents varied significantly ($P<0.05$) with value ranging from 92 g/kg to 250 g/kg on DM basis for *G.robusta* and *C.macrostachyus* respectively. DM degradability at 48 hours and the estimated ME values also varied significantly ($P<0.05$) between shrubs ranging from 6.5 ME MJ/kg DM for *Albizia spp* and *B.micrantha* respectively to 12.9 ME MJ/kg DM for *C. holstii*. The potential degradability (A + B) varied significantly ($P<0.05$) between shrubs, ranging from 522 g/kg DM to 904 g/kg for *Albizia spp* and *C.holstii* respectively. The degradation rate constant (*c*) also varied significantly ($P<0.05$) between shrubs. It ranged from 0.0278 for *T. orientalis* to 0.0584 for *C. holstii*.

It can be concluded that locally available tree and shrub leaves had high nutritive values than crop residues like maize stover especially in terms of N.

Feed	DM g/kg	CP g/kg	DMD 48 h g/kg DM	ME MJ/ kg DM	a + b g/kg DM	c /h
G. robusta	420	92	486	6.9	538	0.0474
Cor. holstii	254	221	507	7.2	597	0.0360
D.afromontana	213	170	601	8.7	690	0.0455
Albizia spp.	372	213	466	6.5	522	0.0463
T.orentalis	389	180	471	6.6	580	0.0278
B.micrantha	370	177	466	6.5	566	0.0306
M.kimandscharica	383	142	620	8.9	706	0.0410
C.holstii	297	154	869	12.9	904	0.0584
P.americana	410	125	502	7.1	541	0.0511
E.japonica	436	104	597	8.6	685	0.0352
C. macrostachyus	204	250	621	8.9	722	0.0318
C.zimmermanni	335	131	498	7.0	563	0.0444
M. discoides	353	229	804	11.8	851	0.0516
I.mitis	459	129	780	11.5	839	0.0504
SED	8.7	3.8	11.5	0.3	4.00	0.0099
F ratio	***	***	***	***	***	***

ME was estimated from DMD 48.