

Prediction of the nutritive value of shrubs and fodder trees by laboratory techniques

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In Tunisia, livestock feeding in arid and semi-arid regions is based on range lands. Management of range species requires knowledge of their palatability and nutritive value. Use of conventional digestion trials with animals to measure intake and digestibility of range species is a complicated, costly and time-consuming operation.

Some laboratory techniques (chemical constituents (OM, CF, CP, NDF, ADF, ADL), condensed tannins, Absorbance at 280 nm (A280)), (Nefzaoui, 1985, Thèse Doctorat, Univ Catholique Louvain, 354 p), *in vitro* organic matter digestibility (IVOMD) (Tilley and Terry, 1963, J Brit Grassl Soc, 18, 104-111), *in sacco* dry matter degradability (Ørskov *et al*, 1980, Trop Anim Prod, 5, 195-213) and gas production (Gas), (Menke *et al*, 1979, J Agric Sci, 92, 499-503) were assayed in our laboratory to predict dry matter (DM) intake and organic matter digestibility (OMD) of 10 fodder shrubs and trees harvested at different seasons (*Acacia cyanophylla* Lindl. : autumn-winter, *Artemisia campestris* : summer, *Artemisia herba alba* : summer, *Atriplex nummularia* : spring-summer, *Ceratonia siliqua* : autumn-winter-summer, *Cistus libanotis* : winter-spring, *Cistus salvifolus* :

spring, *Globularia alypum* : spring, *Pistacia lentiscus* : autumn-spring, *Rosmarinus officinalis* : autumn-spring). These parameters were measured with goats housed in metabolism cages and fed freshly cut forage *ad libitum* in addition to 400 g barley grains.

Regression analyses showed that DM intake may be predicted by A280, *in sacco* degradability or gas production techniques. However, correlation coefficients, though significant, were low. All the tested laboratory techniques did not allow the prediction of OM digestibility. When multiple regression analyses including two or more techniques were done, there was only a slight improvement of intake and digestibility prediction. This may be due to the heterogeneity between studied species. Classification of plant species into a tannin-rich group (3 to 7 %, n = 11) and tannin-poor group (<3 %, n = 7), improved significantly intake and digestibility prediction. Some combination of predictive parameters are listed below.

It can be concluded that, in contrast to common forages, the use of a single or combined laboratory technique(s) is not sufficient to predict the nutritive value of woody species. Working on group of species having the same characteristics is recommended.

	Independent variables	M	r ²	SE	P
DM intake					
all species	CF, NDF, Tannins, A280, <i>in sacco</i>	18	0.68	2.83	0.03
tannin-rich species	CP, CF, NDF, ADL, A280, Gas	11	0.97	1.85	0.01
tannin-poor species	CF, ADF, A280, IVOMD	7	0.99	0.54	0.01
OM <i>in vivo</i> digestibility					
all species	ADL, Gas	18	0.36	2.18	0.02
tannin rich species	NDF, ADL, Gas	11	0.82	1.49	0.02
tannin poor species	CP, ADL, Tan, A280	7	0.99	0.35	0.03
	ADL, A280, Gas		0.99	0.52	0.03