



## Nutritive value and voluntary feed intake by goats of three browse fodder species in the Sahelian zone of West Africa

H.O. Sanon<sup>a</sup>, C. Kaboré-Zoungrana<sup>b</sup>, I. Ledin<sup>c,\*</sup>

<sup>a</sup> *Institut de l'Environnement et de Recherche Agricole, CRREA de l'Ouest, Station de Farako-bà, Bobo-Dioulasso, Burkina Faso*

<sup>b</sup> *Institut du Développement Rural, Université Polytechnique de Bobo-Dioulasso, Burkina Faso*

<sup>c</sup> *Department of Animal Nutrition and Management, Swedish University of Agricultural Sciences, P.O. Box 7024, SE-750 07 Uppsala, Sweden*

Received 4 April 2007; received in revised form 25 September 2007; accepted 2 October 2007

### Abstract

Browsing ruminants have access to different biomass, depending on how high they can reach. Foliage consisting of leaves and green pods from *Acacia senegal*, *Pterocarpus lucens* and *Guiera senegalensis*, was collected according to height above ground accessible to either sheep (0.90 m), goats (1.65 m) or cattle (1.50 m). There was a significant variation in the chemical composition of the biomass between species. The crude protein (CP) content was 114, 157 and 217 g/kg dry matter (DM) and the neutral detergent fiber (aNDF) content 604, 534 and 412 g/kg DM for *G. senegalensis*, *P. lucens* and *A. senegal*, respectively. There was no significant variation in chemical composition according to the height accessible by cattle, sheep or goats. The voluntary intake was studied using eight goats per diet. The six diets consisted of the three browse leaves and two pods (*A. senegal* and *P. lucens*) and a control. The leaves were fed combined with hay of *Schoenefeldia gracilis* (maximum 30%) and the control was pure hay. Apparent digestibilities of the same diets, with the exception of *G. senegalensis*, were measured using five goats per diet. All browse fodders used in the feeding

*Abbreviations:* ADL, acid detergent lignin; ADF, acid detergent fiber; aNDF, neutral detergent fiber; BW, body weight; CP, crude protein; DM, dry matter; GLM, general linear model; N, nitrogen; NS, not significant; OM, organic matter; PPR, peste des petit ruminants;  $W^{0.75}$ , metabolic body weight.

\* Corresponding author. Tel.: +46 18 671646; fax: +46 18 672995.

*E-mail address:* [Inger.Ledin@huv.slu.se](mailto:Inger.Ledin@huv.slu.se) (I. Ledin).

and digestibility trials were high in CP (105–170 g/kg DM) and lignin (164–234 g/kg DM except *A. senegal* leaves) and low in fiber (322–590 g/kg DM of NDF) compared to the hay (31 g/kg DM of CP and 755 g/kg DM of NDF). The highest intake was of the *P. lucens* diet (864 g) and the lowest of the *G. senegalensis* diet (397 g). The intake of pods from *A. senegal* was higher (1033 g) than from *P. lucens* pods (691 g). The apparent digestibility of OM and CP in the browse leaves was 0.63 and 0.57 and 0.63 and 0.64 for *A. senegal* and *P. lucens*, respectively, higher than for the hay, which showed higher digestibility of NDF. *A. senegal* pods had higher digestibility for all nutrients than *P. lucens* pods. Based on the high CP content and the intake and digestibility characteristics, *P. lucens* leaves and *A. senegal* leaves and pods can be recommended as protein supplements to low quality diets. © 2007 Elsevier B.V. All rights reserved.

**Keywords:** *Acacia senegal*; *Pterocarpus lucens*; *Guiera senegalensis*; Browse fodder; Chemical composition; Intake; Digestibility

## 1. Introduction

Browse constitutes an important fodder component for ruminants in tropical dry areas especially in the dry season when the available grazing is not of sufficient quality or quantity to meet the maintenance requirements of the animals (Leng, 1997).

Many studies have been done on the chemical composition of browse species, and the protein, mineral and vitamin concentrations have in general been shown to be adequate for the maintenance requirement of grazing animals (Fall-Touré et al., 1998; Aganga and Mosase, 2001). In tropical dry Africa, the concentration of crude protein (CP) in the leaves and fruit of the majority of fodder trees and shrubs is above 10%, even in the dry season, when it tends to decrease (Dicko and Sikena, 1992). Breman and Kessler (1995) estimated the average concentration of CP in foliage of browse plants in the Sahelian and Sudanian areas of West Africa to be 150 g/kg DM, with variations between 100 and 206 g/kg DM. The highest concentration, with an average above 187 g/kg DM, has been recorded in foliages of *Acacia ataxacantha*, *Acacia senegal*, *Boscia senegalensis*, *Cadaba farinosa* and *Maerua crassifolia*.

Studies (Bergström, 1992; Woolnough and Du Toit, 2001) have also shown that there are chemical (tannins) and physical (thorns and spines) defences against herbivores for the survival of the plants, particularly in juvenile stages when the plants must protect themselves until first reproduction.

Chemical composition alone is, however, an inadequate indicator of nutritive value, since the availability of nutrients from forages is variable. The nutritive value of a feed is a function not only of chemical composition but also of intake characteristics and the efficiency of extraction of nutrients from the feed during digestion (Mandal, 1997). The utilization of browse is limited by the lignin content and/or the presence of anti-nutritional factors, which may be toxic for ruminants. The most important anti-nutritional factor cited is tannin, which is shown to decrease digestibility in browse fodders. The type of tannin (hydrolysable or condensed), the level and the activities of tannin in browse are variable leading to varied effects on the reduction of digestibility (Ebong, 1995). Thus McSweeney et al. (1999) reported that content of tannins is not a reliable measure when predicting

Download English Version:

<https://daneshyari.com/en/article/2420592>

Download Persian Version:

<https://daneshyari.com/article/2420592>

[Daneshyari.com](https://daneshyari.com)