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Effects of *Calliandra calothyrsus* and *Leucaena leucocephala* supplementary feeding on goat production in Cameroon

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Abstract

The study of the effect of *Calliandra calothyrsus* and *Leucaena leucocephala* supplementary feeding multipurpose leguminous tree (MPLT) on goat production in Cameroon was conducted at Dschang University research farm on 24 West African dwarf goats of 2–3 years of age, each in the dry season (November 2001 to April 2002) and rainy season (March to September 2003). At the beginning, two bucks were introduced to the herd for 2 months and breeding allowed. The males were removed thereafter and the herd divided in two groups. One group was subjected to supplementary feeding with *C. calothyrsus* and *L. leucocephala* leaves harvested in the morning, mixed in equal quantities by weight and distributed at the rate of 800 g per goat and per day. The other group not supplemented, thus served as control. Animals were weighed at the beginning of the supplementation, before kidding, after kidding and every 2 weeks until weaning. Supplementation reduced the incidence of abortion and increased the overall yield of kid per animal. During the 3 months postpartum period, the body weight decreased as compared to that recorded at parturition but the supplemented goats continued to have 11–15% more body weight than their respective control during the dry season whereas during the rainy season the difference between supplemented and non-supplemented goats were not so elaborated. This indicates the effect of the scope and importance of the supplementation for those animals particularly during the dry season.

Keywords: West African dwarf goat; *Calliandra calothyrsus*; *Leucaena leucocephala*; Supplementation; Growth; Reproduction; Cameroon

1. Introduction

West African dwarf goat (WADG) is an integral component of Cameroonian livestock that contributes substantially to the national economy. The production potential of the WADG is, however, very low (Pamo et

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al., 2002), mainly because of lack of proper nutrition. The quantity, and mainly the quality of the consumed forage restrict animal growth rate production and reproduction in several ruminants species (Bosman et al., 1995; Areghore, 1995; Pamo et al., 2001; Makkar, 2002). Nitrogen content is generally very low and fibre content is high both in grass and crop residues, which form the basis of animal diet in the African tropical climatic zones particularly during the dry season. Supplementation of these roughages is a promising and best way of alleviating nutrient deficiencies in ruminant livestock. Different kinds of supplementary feeding have been advocated to boost goat production (Adejumo and Ademosum, 1991; Palmer and Tatang, 1996) of which supplementary feeding with leguminous tree leaves viz. *Calliandra* and *Leucaena* are of high merit because of their high biomass (AFNETA, 1991; Duguma et al., 1994), high potential for soil fertility improvement (AFNETA, 1991; Hussain et al., 1991; Duguma et al., 1994) and high potential as forage (NAS, 1979; Mecha and Adegbola, 1980; Brewbaker, 1986; Topps, 1992). The fodder trees are high in protein compared to grasses (Rittner and Reed, 1992), remain green longer into the dry season and have a nutritive value that varies little from one season to another in Africa.

In deed legume tree, leaves maintain higher protein and mineral contents during their growth, whereas these nutrients decline with progress to maturity in grasses. Studies have revealed that leguminous trees with good fodder value like *Leucaena* and *Calliandra* have a vast potential for growth in sub-Saharan Africa including Cameroon (Pamo et al., 2002). Sound information on the usefulness of feeding multipurpose leguminous tree (MPLT) leaves on production of WADG is lacking particularly in Cameroon and Central Africa sub-region. The present study was, therefore, undertaken to evaluate the effects of supplementary feeding of *Calliandra calothyrsus* and *Leucaena leucocephala* leaves on growth and production of West African dwarf goat.

2. Material and methods

The study was conducted at Dschang University animal farm on 24 West African dwarf goats each in dry (November 2001 to April 2002) and in rainy (March to September 2003) seasons. West African dwarf goat is an animal with disproportionately short leg and are common in and near the tropical forest belt in West and Central Africa, but its distribution does not extend to East Africa (Steele, 1996). These goats are about 50 cm in height and 20–30 kg in weight, tending to be larger as the savannah zone is approached. Growth rate and milk yield are very low, and they breed at all time of the year. They are used almost exclusively for meat production, and the skin is also usually eaten. Its most useful peculiarities are its adaptation to the humid tropical environment, and resistance to trypanosomiasis (Devendra and Burns, 1983). Animals of 2–3 years of age and 14–25 kg body weights were procured from the local market and were considered as fertile because of having kidded at least once. They were dewormed with Levamisol, injected i.m. at the rate of 1 ml/10 kg body weight at their introduction on the farm. They grazed on mixed pasture comprised of *Brachiaria ruziziensis* and *Pennisetum purpureum* between 9 a.m. and 5 p.m. When goats came back from the pasture, they were kept in pens of five to seven each and were fed *Trypsacum* grass ad libitum. After about a month, two bucks were introduced in the herd for 2 months and breeding allowed. The males were removed thereafter.

Goats were divided into two equal groups of 12 animals each. One group was supplemented while the other one did not receive any supplement and served as control. To avoid dominance behaviour and to ensure equal access to the supplement, goats with less than or more than 16 kg body weight were put in separate pens. On the basis of previous studies carried out in the region (Pamo et al., 2002, 2004), the mixture of *C. calothyrsus* and *L. leucocephala* leaves were harvested in the morning and mixed in equal quantities by weight, was left in the pens at the rate of 800 g per goat for eating at night.

The following observations were made:

(i) Intake of the supplement was calculated from its leftover every morning.
(ii) Goats were weighed using electronic balance (HDK 60 ± 0.01 kg) on the day of the start of supplementation, just before and after kidding and every 2 weeks thereafter up to 3 months.
(iii) The number of kids born, along with their sex, was recorded.