Short Communication

Evaluation of *Gmelina arborea* Leaves Supplemented with Grasses (*Panicum Maximum* and *Pennisetum purpureum*) as Feed for West African Dwarf Goats

G.O. Okagbare¹, O.J. Akpodiete¹, O. Esiekpe¹ and O.M. Onagbesan²*
¹Department of Animal Science, Delta State University, Asaba Campus, Asaba, Nigeria; ²Department of Animal Science, IRS, University of Wales, Llanbadarn Campus, Aberystwyth, Wales, UK

Correspondence and current address: Laboratory for Physiology and Immunology of Domestic Animals, Department of Animal Science, Catholic University of Leuven, Karsteelpark Arenberg 30, B-3001 Heverlee, Belgium

E-mail: Okanlawon.Onagbesan@agr.kuleuven.ac.be


**Keywords:** feed utilization, *Gmelina arborea*, *Panicum maximum*, *Pennisetum purpureum*, West African dwarf goats

INTRODUCTION

The dearth of feeds during the dry season is a major problem facing livestock farmers in Nigeria. During this season, which spans a period of 6 months (November–April), forage dries up and farmers have to take their animals long distances in search of feed. The resultant effects are loss of weight and high mortality due to malnutrition. This calls for a search for plants that can withstand the long period of drought characteristic of tropical environments and can be used as feeds for ruminants. Multipurpose tree shrub fodders are important feed resources for bridging the seasonal deficit in feed quantity and quality (Topps, 1992). However, there are varieties of leguminous and non-leguminous plants of which very little is known about their feeding potential. *Gmelina arborea* is a fast growing, non-leguminous multipurpose tree that produces appreciable amounts of forage even at the peak of the dry season, thereby ensuring a year-round supply of forage and fodder. The leaves are relished by West African Dwarf goats and sheep (Adu *et al.*, 1996; Okagbare and Bratte, 1999; Obiazi and Ojeifo, 2000) and are often relied on by local people as animal feed.

Reports of earlier studies (Onabanjo and Onwuka, 1998; Okagbare and Bratte, 1999) indicated that goats fed *Gmelina arborea* leaves alone consistently lost weight. This was attributed to inadequate energy intake by the goats to meet their requirement
for maintenance and suggested that supplementation of *Gmelina arborea* leaves with grasses or energy-based feeds might enhance its utilization. This study was designed to assess the performance of West African Dwarf goats fed *Gmelina arborea* leaves supplemented with grasses as source of digestible energy.

**MATERIALS AND METHODS**

*Animals and their management*

Eighteen growing female, non-pregnant, non-lactating, West African Dwarf goats weighing 5.5–7.8 kg were used for the study. The goats were obtained from the Teaching and Research Farm of the Delta state University, Asaba Campus, Nigeria. The animals were doped and dewormed as routine, individually penned and fed under a common roof.

The goats were weighed and divided randomly into three groups of 6 goats each. Those in group A were fed *Gmelina arborea* leaves plus guinea grass (*Panicum maximum*), while those in group B were fed *Gmelina* leaves plus elephant grass (*Pennisetum purpureum*). Goats in group C were fed *Gmelina* leaves only. For animals in groups A and B, *Gmelina* leaves accounted for 50% of their ration. The goats were fed at 5% of their body weight for 90 days. The feed allowance was offered twice daily at 08:00 and 14:00. Fresh leaves of *Gmelina* and grasses were harvested without regard to the age of the leaves and offered to the goats. The goats were observed during feeding and samples similar to the foliage selected by the animals were taken from branches that were not offered for consumption. These samples were pooled, oven-dried and used for chemical analysis. The goats had free access to salt licks, and fresh clean water was provided daily. The experiment was repeated three times.

The pens were cleaned daily and leftovers of feed from the previous day were removed before supplying fresh rations. The feed given and leftovers were weighed daily. The goats were weighed weekly before morning feeding.

*Feed and data analysis*

Samples of feeds were analysed for their proximate constituents using the procedures of the AOAC (1995). The energy content of feeds was determined using the ballistic bomb calorimeter. Data collected were subjected to analysis of variance and the treatment means were separated using the Duncan's multiple range test (Steel and Torrie, 1980).