

**Towards breed characterisation of the West African Dwarf goat.**

**O. J. Ifut**

Department of Animal Science, University of Uyo, Uyo, Nigeria.

**Introduction**

The term "West African Dwarf goats" (WADG) describes a collection of subtypes and races of goats often recognised by the name of the country of their location and type of habitat. Though markedly dwarfed (30 - 50 cm high), larger than typical WADG are also often included in this main type.

The physical, well documented characteristics of WADG include live weights (LW) of 20 - 25 kg males, 18 - 22 kg females, both sexes horned, horizontally carried short to medium ears, strong fairly long neck, deep broad chest, and variable colour of dark brown, black, white, red, pied and mixed (1). The conformation characteristics of WADG of southeastern Nigeria have been highlighted (2). Strong interrelationships were shown to exist between body length (BL) and heart girth (HG), and BL and height-at-withers (HW) in these goats. In spite of these, indigenous small ruminant breeds have hardly been adequately characterised (3). The present study examined WADG biodata and sought to establish some bases for characterising the WADG.

**Materials and Methods**

LW and body linear measurements of 214 (51 bucks and 163 does) randomly selected WADG, aged 2 - 42 months, from 25 farming households in 5 study locations in Southeastern Nigeria were taken. The study area lies between 04°32' and 05°33'N and 07°25' and 08°25'E, is characterised by a humid climate with a mean annual rainfall of 2115mm, bimodal in nature, a mean monthly temperature of 27°C and a mean relative humidity of 81.60%.

The LW and body linear measurements - BL, ear length (EL), face length (FL), HG, HW, neck length (NL), tail length (TL) and tail width (TW) - were done as described (2). In the absence of records dentition was used to determine age (4) and grouped into 2 - 8, 9-15, 16-22, 23 - 29, 30 - 26 and 37 - 42 - month age strata, according to sex, for analysis. Bucks were aged 2-15 months only because majority beyond 15 months had been sold and / or slaughtered.

**The Model**

A table showing the ratios of the pair-wise parameters HG:BL, HW:BL, HW:HG, NL:HG, TL:EL, FL:NL, TL:FL and TW:TL (1.1, 0.9, 0.8, 0.2, 1.0, 1.2, 0.6, and 0.4 respectively) corresponding to  $P_1, p_2 \dots p_j \dots, p_s$  respectively and the age groups (months) 2 - 8, 9 - 15, 16 - 22, 23 - 29, 30 - 36, 37 - 42 corresponding to  $a_1, a_2, \dots a_i \dots a_s$  respectively as appropriate to each sex was set up as shown below.



Sex	Age (Months)	Ratios of body linear measurements		$\delta$	$\bar{\delta}$
		$d_{11}$	$d_{12}$ ... $d_{1j}$ ... $d_{1n}$		
Females and/or Males	$a_1$	$d_{11}$	$d_{12}$ ... $d_{1j}$ ... $d_{1n}$	$\delta_1$	$\bar{\delta}_1$
	$a_2$	$d_{21}$	$d_{22}$ ... $d_{2j}$ ... $d_{2n}$	$\delta_2$	$\bar{\delta}_2$
	$a_n$	$d_{n1}$	$d_{n2}$ ... $d_{nj}$ ... $d_{nn}$	$\delta_n$	$\bar{\delta}_n$
				$\Delta$	$U$

A model  $U = \sum_{j=1}^n \sum_{i=1}^n d_{ij} = \frac{\Delta}{8n} = \sum_{i=1}^n \delta_i = \sum_{j=1}^n \bar{\delta}_j$  to set the universal goat scale (ugs) is proposed for characterisation of goat breeds, including the WADG.

**Results and Discussion**

The values of the specific pair-wise parameter ratios tend to underscore some genetic phenomenon. For example, the HG:BL ratio of 1.1 for all goats, irrespective of age and sex, is quite significant, so also are the other constant ratios. The body linear measurements of a goat are basically genetically controlled and unique to each breed of goats. Age only provides a time frame within which the genetic potentials express themselves. Since the sum total of all the genetic traits (i.e whole goat) is exposed to uniform physical, nutritional, disease and parasite environments and their intra and inter interactions at any given time, these different parts respond differently to them according to the genetic blueprint of the animal. Some random body linear measurements selected and expressed in simple pair-wise rational relationship represent some genetic 'compact disc' of information, peculiar to the given breed of goats. The resultant ratios of some of the pair-wise relationships have been reasonably constant to be used as their distinguishing characteristic. Since additive and interactive gene effects are assumed, the sum of the sum of specified pair-wise ratios ( $\Delta$ ) is assumed to represent the entire animal. Consequently, the mean value of all the mean values ( $U$ ) represents the overall mean worth of the animal on the ugs.

In this study the constant ratio of  $0.77 \pm 0.02$  (or  $77 \pm 2\%$  ugs) can be used as one of the distinguishing characteristics of WADG.

**References**

1. Wilson, R.T. 1991. FAO Animal Production and Health Paper 88:231.
2. Ifut, O. J., Essien, A. I. and Udoh, D. E. 1991, Beitr. Trop. Landwirtschaft, Vet. Med. 29(H.2):215-222
3. Regc, J. E. O. 1994. Small Ruminant Research and Development in Africa: 205-211.
4. Sastry, N. S. R. and Thomas, C. K. 1980, Farm Animal Husbandry, 29-45.