FACTORS AFFECTING LIVEWEIGHT OF GOATS AND SHEEP IN TWO LOCATIONS WITHIN OGUN STATE.

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ABSTRACT

A study was conducted over two years to determine the changes in the liveweight of goats and sheep in two locations in Ogun State, Nigeria. Factors found to be important included breed of goat, season, location, and sex of the animal. The Maradi goat had a greater variation in its liveweight than the West African dwarf goat. The mean weekly gain in the liveweight of goats was 0.18±0.02 kg in the dry season and 0.26±0.05 kg in the wet season. Liveweight changes were greater in yearling Yankasa sheep reared in this part of the Southwestern Nigeria than in older ones; these differences were significanlty greater in the dry than in the wet season.

Key words: Liveweight, Goats and Sheep.

INTRODUCTION

The Yankasa sheep has been described as one of the four breeds of sheep indigenous to Nigeria, the others being the West African dwarf breed, the Uda breed, and the Balami breed (Osuagwuh, 1985). Both the Yankasa sheep and the Maradi goat are commonly found in the savanna areas of Nigeria but are now appreciably reared in many private and institutional farms in the rain forest region, especially in South-Western Nigeria where they find ready markets during festive occasions. Adu and Onwuka (1991) reported that the Yankasa sheep was superior to the West African dwarf sheep which is indigenous to the rain forest region in terms of yearling weight, liveweight productivity per animal, and annual rate of return.

Poor management and nutrition have been observed to adversely affect the performance of goats (McDowell and Bove, 1977). Goats have been reported to show a unique ability to choose and maintain diets of higher nutritive value in the dry season relative to sheep and cattle (Le Houerou, 1980; Coppock *et al.*, 1986). With the growing popularity of the Yankasa sheep and Maradi goat in South-Western Nigeria has arisen the need to investigate their productivities in the region. Since changes in liveweight constitute an important economic trait in meat animals (Acharya, 1988), this study was undertaken to determine the factors affecting changes in the liveweight of straight-bred goats and sheep in two locations in Ogun State, Nigeria.

MATERIAL AND METHODS

Three hundred and fifty Yankasa sheep, one hundred and eighty Maradi goats and two hundred and twenty-six West African dwarf (WAD) goats of both sexes and aged between one and three years were studied. The animals were reared in two locations in Ogun State. Environmental conditions in the two locations have been detailed in an earlier paper (Ikeobi, 1994). Average air temperature and relative humidity in the two locations were 34^0C and 54.4% respectively for the dry season, and 28°C and 83% respectively for the wet season. Pasture crops grown in both locations included guinea grass *(Panicum maximum),* giant star grass *(Cynodon nlemfuensis Var robusta)* gamba grass *(Andropogon gayanus), Centrosema Pubescens,* and *Tridax Spp.* Browse plants like *Gliricidia sepium and Leucaena leucocephala* were grown and used as hedges. The animals were managed semi-intensively. Housing was provided for the animals where they are rested and provided with water, mineral supplements and sun-dried peels of *Manihot spp.* They were allowed into the pastures to graze at 10:00 hours and at 16:00 hours each day. Body weight measurements of the animals were taken weekly over the wet and dry seasons in

1991 and 1992. The general linear models (GLM) procedure (SAS, 1985) was used to repectively analyse data on goat and sheep liveweights using the following models:

Y_{ijklm} = $u + Si + Bj + Tk + Rl + (SB)ij + Eijklm$ (Goats)

Y_{ijkl} = $\mu + Si + Tj + Rk + Eijkl$ (Sheep)

Y_{ijkl} (m) = observed value of goat/sheep liveweight.

u = overall mean when equal subclass frequencies exist.

Si = effect of the ith season.

Bj = effect of the jth breed of goats.

Tj = effect of jth sex

Tk = effect of the kth sex.

Rk = effect of kth location.

Rl = effect of the lth location

(SB)ij = effect of the interaction of season and breed of goats.

Eijkl(m) = random error normaly distributed with zero mean and variance $\sigma^2 e$

Analysis of variance was done to pre-test the effects of two-factor interactions and these were found to be non-significant ($P > 0.05$), with the exception of the interaction of season and breed of goats. Only this was therefore included in the model. Duncan's (1955) mean separation procedure was applied to those effects which were significant.

RESULTS AND DISCUSSION

Table 1 shows the significance of Fisher ratios in the analyses of variance for both liveweight and liveweight changes in goats and sheep. The effects of season and location were significant for liveweight and liveweight changes in both species. Breed effect and the effect of interaction of breed and season were significant for goat weight and weight changes. Significant sex differences were observed for sheep liveweight but these difference were not significant for goat weight and weight changes.

Liveweight and liveweight changes were significantly ($P < 0.05$) greater in maradi goats than in WAD goats (Table 2). The changes in liveweight averaged 240 grams per week for the Maradi goat and 150 grams per week for the WAD goat. In both sheep and goats, body weight and body weight changes were significantly greater in the wet season than in the dry season. Goat live weight in the wet season was 38% greater than the figure in the dry season. The mean changes in the liveweight of goats was 180 grams in the dry season and 260 grams in the wet seaon. The body weight of Yankasa sheep in the wet season was 10.89% greater than the dry season weight. Male animals were generally heavier than the females. The differences between Yankasa rams and ewes were significant ($P < 0.05$). The significantly greater changes in the liveweight of Maradi goats over those of WAD goats may be due to the genetic difference between the two breeds. Maradi goats have longer limbs and generally larger trunks than the WAD goats and so would be expected to carry more flesh. Ebozoje (1992) described the Maradi as a large, fast-growing, early-maturing meat breed.

Seasonal difference in the availability and quality of forage may be reponsible for the variation in body weight and its changes in both species between the seasons. Dry season forage had been reported to be of low quality, with high dry matter and fibre contents and low digestible protein content (Webster and Wilson, 1980). This then emphasises the need for a greater mobilisation of resources to ensure adequate and nutritive feeds for the animals during the dry season; This

TABLE 1: **P-VALUES FOR TESTS OF SIGNIFICANCE OF EFFECTS FOR GOATS AND SHEEP TRAITS**

Source of Variation	Goat Liveweight	Goat liveweight Changes	Sheep Liveweight	Sheep Liveweight Changes
Season	0.047	0.001	0.030	0.010
Sex	0.180	0.140	0.001	0.160
Location	0.001	0.033	0.001	0.002
Breed	0.001	0.037	-	-
Season x breed	0042	0.021	-	-

TABLE 2: MEAN VALUES OF GOAT AND SHEEP LIVEWEIGHT AND LIVEWEIGHT CHANGES

Variable		Goat Traits* n	Liveweight kg	Liveweight Changes kg	Sheep Traits* n	Liveweight kg	Liveweight Changes kg
Overall means		406	14.00	0.17	150	20.87	0.24
	s.e.		0.58	0.02	1.14	0.04	
Season:	Dry	203	13.00[b]	0.18[b]	175	19.76[b]	0.19[b]
	Wet	203	18.01[a]	0.26[a]	175	29.95[a]	0.27[a]
Average	s.e		0.58	0.02		1.07	0.03
Sex	Male	166	14.07	0.18	164	24.52[a]	0.24
	Female	240	13.61	0.12	186		0.23
16.92b							
0.23							
Average	s.e.		0.66	0.02		0.96	0.04
Location:	1	174	19.82[a]	0.24[a]	176	29.15[a]	0.40[a]
	2	231	12.30[b]	0.15[b]	174	16.97[b]	0.16[b]
Average	s.e.		0.48	0.02		0.87	0.03
Breed:	Maradi	190	19.36[a]	0.24[a]	-	-	-
	WAD	226	15.53[b]	0.16[b]			
Average	s.e		0.49	0.02			

n: Number of observations.
*: For each variable, means without a common superscript differ significantly ($P < 0.05$).

TABLE 3: BRE D DIFFERENCES IN LIVEWEIGHT AND LIVEWEIGHT CHANGES IN GOATS BETWEEN SEASONS.

	Wet Season*		Dry Season*	
Breed	Liveweight kg	Liveweight changes kg	Liveweight kg	Liveweight changes kg
Maradi	21.90a	0.27	19.43[a]	0.17[a]
WAD	16.55b	0.24	14.51[b]	0.08[b]

*Values in the same column without a common superscript differ significantly ($P < 0.05$).

supplementation appears to be more crucial for the larger breeds than for the small ones. Along this line, Devendra (1987a,b) suggested some nutritional strategies to include the increased use of dietary nitrogen sources agro-industrial by-products, crop residues and non-conventional feed-stuffs, increased forage utilisation, and the use of urea-molasses block licks. Degen and Young (1981) also reported that total intake of dry matter was significantly lower in the dry season than the wet season and attributed this to the depressing effect of high ambient temperature on feed intake. The average environmental temperature recorded during this study was higher in the dry season (34^0C) than in the wet season (28^0C).

Furthermore, the better performance of the Maradi goat in the dry season relative to the WAD goat may be due to the physiological characteristics of Maradi goats as savanna animals showing a remarkable feature of water economy. King (1979) observed similar trends for desert animals in East Africa. The non-significant sex difference in goat's weight and liveweight changes may be as a result of the higly temperamental nature of the buck on reaching sexual maturity which tended to reduce feed intake and slow down liveweight gain. McDowell and Bove (1977) observed this phenomenon in goats.

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