



Introduction

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CLUSTER ANALYSIS OF YEARLING BODY WEIGHT OF SHEEP OF NORTHERN NIGERIA AND THEIR CROSSES

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INTRODUCTION

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- Balami sheep has the largest body size among sheep of Northern Nigeria.
- The breed is confined to the most arid areas of the country (Sudan savannah).
- Uda is also found in somewhat arid environments.
- Yankasa is adapted to the areas with relatively more rainfall (Northern Guinea Savannah).



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- Strategy for improving breeds that are adapted to the semi-arid and arid climate (water and feed scarce areas) needs to:
 - (1.) consider their unique attributes and focus on improvement within breed.
 - (2.) engage some level of crossbreeding with animal that are adapted to such climates (Tibbo *et al.*, 2006).



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- Improvement programmes involving sheep in Nigeria will need an appropriate evaluation of all the breeds in an environment where feeds and animal genetic resources (AnGR) is abundant.
- This study was however aimed at investigating the clumping structure of yearling body weight among sheep of Northern Nigeria and their crosses using cluster analysis.



MATERIALS AND METHODS

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- The study was conducted at NAPRI, Shika Zaria.
- Balami, Uda and Yankasa breeds were crossed using diallel breeding.
- Body weight of the yearling were recorded using Salter® weighing scale to the nearest kilogram.
- The yearling weight data were analyzed using General Linear Model of SAS (SAS, 2004).
- Pair-wise difference was used to compare the means (SAS, 2004).



MATERIALS AND METHODS

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- Distances were used to construct dendrogram using the Unweighted Pairs Group Method Analysis implemented in R 2.13.0 (R Development Core Team, 2015).
- TREE procedure that prints the dendrogram based on the distances among the clusters was introduced in PROC CLUSTER procedure.

Table 1: Effect of yearling genotypes on body weight of yearling at 12 months of age

Sire breed	Dam breed	Yearling genotype	Number	BWT_12 (kg)
Yankasa	Yankasa	YK X YK	25	14.79±0.80 ^f
Uda	Uda	UD X UD	6	17.43±1.64 ^e
Balami	Balami	BL X BL	3	29.10±4.02 ^a
Yankasa	Uda	YK X UD	9	16.90±1.34 ^e
Yankasa	Balami	YK X BL	3	15.12±4.02 ^f
Uda	Yankasa	UD X YK	8	16.78±1.42 ^e
Uda	Balami	UD X BL	3	20.50±4.02 ^c
Balami	Yankasa	BL X YK	3	24.00±2.84 ^b
Balami	Uda	BL X UD	3	18.20±2.84 ^d
		Overall mean		16.54
		SEM		0.35

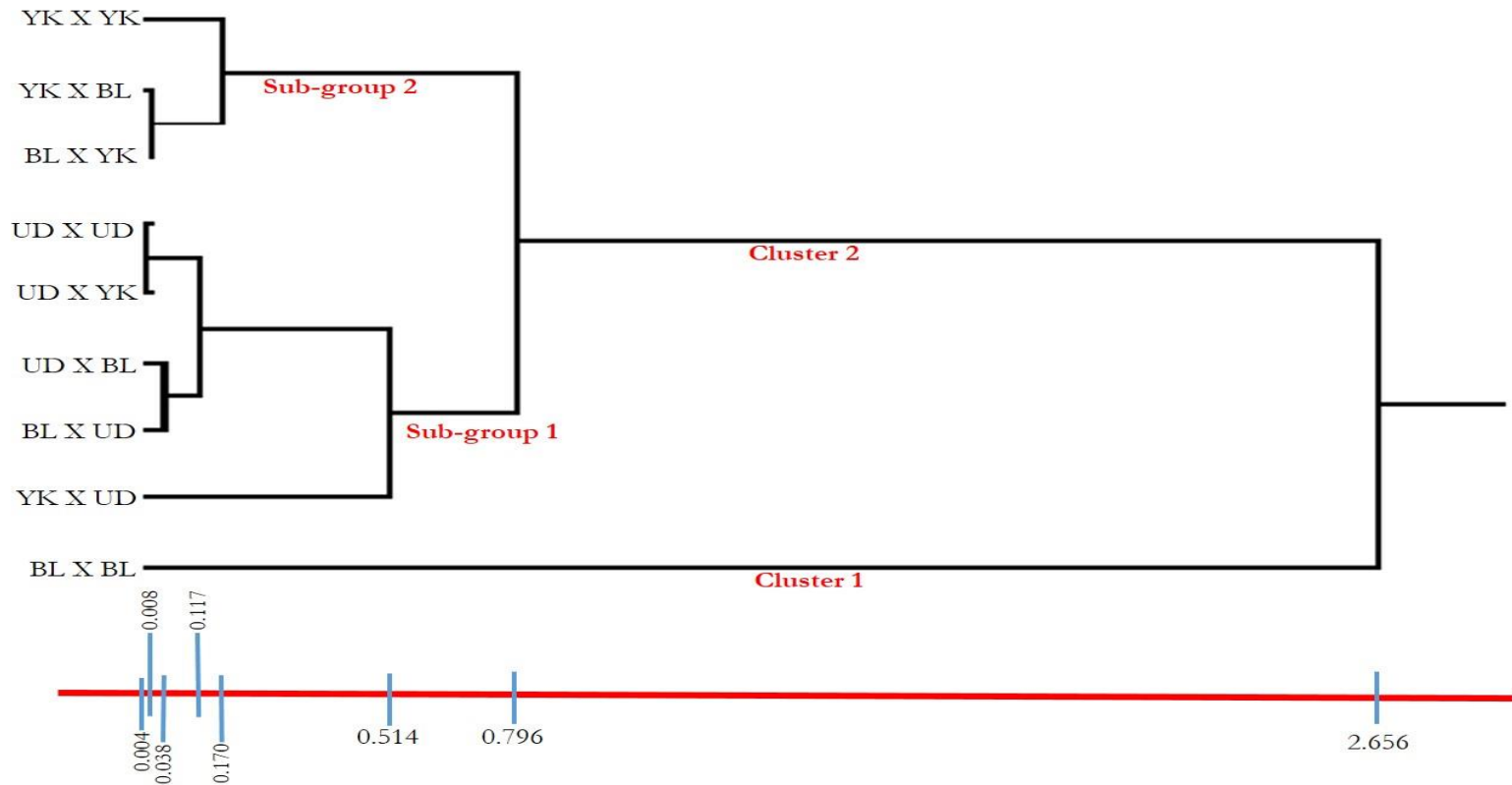


Figure 1: Hierarchical clustering dendrogram obtained by different distances among genotypes of sheep using body weight at 12 months of age



RESULTS AND DISCUSSION

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- One of the reasons for estimating genetic distance is to evaluate the expected heterosis when breeds of the same species are crossed.
- Genotypes whose genetic distance are farther being expected to express more heterotic effects.
- Pure Balami sheep in this study had the farthest genetic distance of 2.636 with all the other genotypes considered.
- This was in agreement with Yunusa *et al.* (2013) who reported that there is room for improvement of the indigenous breeds of sheep especially between Southern and Northern breeds.



CONCLUSION AND RECOMMENDATION

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- The yearling body weight of Balami was superior to that of other genotypes.
- The cluster analysis grouped pure Balami yearling distinctly from other genotypes.
- Improvement programmes of Nigerian sheep breeds should consider exploitation of the genetic potentials of Balami rams and ewes in terms of fast growth rate.



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