RELATIONSHIP AMONG LIVEWEIGHT AND LINEAR DIMENSIONS OF YANKASA SHEEP IN HADEJIA LIVESTOCK MARKET, JIGAWA STATE

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ABSTRACT

The liveweight (LW) and linear body measurements (LBMs) of one hundred and twenty (120) yearling Yankasa Sheep from Hadejia Livestock Market were used for the study. The LBMs were Age, Backlength (BL), Tail length (TL), Ear length (EL), Horn length (HL), Neck length (NL), Height at Withers (HAW), Heart girth(HG) and LW. The correlation coefficient of LW and all LBMs were positive. The strongest and weakest relationship were observed between LW and HL ($r = 0.680$; $P < 0.01$), and LW and TL (0.124) respectively. HAW and HG could be used to predict the LW among all the LBMs.

INTRODUCTION

Within the indigenous sheep breeds of about 22.3 million (PDLPCS, 1991) mainly kept for meat in Nigeria, Yankasa sheep is the most numerous and most widely distributed throughout the various ecological zones (Guinea and Sudan savanna). It is estimated to constitute 60% of the total national flock. Being a medium-sized breed, in addition to its hardness, it seems to be very popular among sheep farmers (Afolayan,1996). Sheep is a major component of the livestock production system in the northern part of Nigeria (Mukasa *et al.*, 2011). The importance of LW in assessing the economic value of farm animals cannot be ever emphasized. There is often a great need for livestock herdsmen to know how much their animals weight, possible reasons overtime for this may include management decisions, such as how much to feed, when to bred, determination of dosages of various medications and vaccines and most importantly is when to market as either weaners, growers or for slaughter (Mbap and Bawa, 2001). The relationship existing among linear body traits provide useful information on performance, productivity and carcass characteristics of animals. Most of the linear body parameters reflect primarily the length of long bones of the animals. The animal LBMs analyses had been used to predict live gain, extreme relationship among economic characteristics, reproduction, performance and to study the relationship between heredity and environment and such studies had found application in selection and breeding (Owojori *et al.*, 2007). Several research findings have shown that LBMs are closely related to LW in poultry (Akanno *et al.*, 2002; Ibe, 1989 and Ibe, 1990), sheep and goat (James *et al.*, 2007 and Ladan *et al.*, 2009), pigs (Machebe and Ezekwe, 2008) and rabbits (Ebegbolem and Okon, 2012). Such zoometrical measurement of body parts can be used to predict LW at relatively lower cost with a high relative accuracy and consistency. Body dimensions describe an animal more completely than conventional methods of weighing and grading (Dim *et al.*, 2012). This study was therefore carried out to further asses how LW can be predicted from LBMs among Yankasa sheep.

MATERIALS AND METHODS

The study was conducted at Hadejia town, which is located in the north-eastern part of Jigawa State. Hadejia Emirate comprises of Hadejia, Mallam-Madori, Kafin-Hausa, Birniwa, Guri, Kirikasamma, Kaugama and Auyo Local Government Areas. Hadejia Emirate lies between 9^0 37'E and 10^0 35'E longitude and between 11^0 57'N and 13^0 O2'N Latitude. It is bounded to the east by Yobe State and Bauchi State to the south and south-east. To the south-west is Dutse Emirate (Jahun and Miga Local Government Areas) and to its north-west boundary is Gumel Emirate (Maigatari and Gagarawa Local Government Areas). The old town is walled with newer physical development having extended outside the

walls. It is bounded on the immediate south by Hadejia River. The railway line from Kano to Nguru passes at the northern sector of the town and through Mallam-Madori. Hadejia Livestock market was selected because of its high population density, hence presence of more sheep in the livestock market (Umar and Kazaure, 2012). The market was divided into five blocks and in each block, two Yankasa sheep were selected using simple random sampling technique, making a total sampling size of ten Yankasa sheep per week (Market day). The experiment lasted for twelve weeks, hence one hundred and twenty Yankasa sheep were selected for a period between 28th April to 8th July, 2012. Data collected on each Yankasa sheep included age (dentition formula), BL (distance from the base of the neck to the base of the tail), TL (distance from the base of the tail to the end of the tail), HL (distance between the base of the horn to the end of the horn), NL (distance between the end of the head to the shoulder blade), and HG(circumferential measure taken around the chest, just behind the front legs and withers) were determined using a tailor's tape while HAW (distance from the surface of a plat form on which the animal stands to the withers) was obtained using a graduated bar and LW was recorded using birth room scale. All the parameters were estimated when the goats were restrained by holding (Bello *et al.*, 2013).

Data collected were analyzed using descriptive statistics and liner correlation procedure (SAS, 1999) which was used to establish the strength of linear relationship and association between the different linear body parameters.

RESULTS AND DISCUSSIONS

The result of the correlation analysis is presented in table 1. HAW is highly and positively correlated with TL (r= 0.625;p<0.01) and HL (r=0.631; p<0. 01). HG is also positively and highly correlated (r=0.608; p<0.01) with TL. There is also highly and positive correlation (r=0.680; p<0.001) between LW and HL, and between HL and EL (r=0.600; p<0.001). BL is positively and significantly correlated with all the physical body parameters measured such as TL (r=0.439; p<0.05), EL (r=0.350; p<0.05), HL (r=0.368; p<0.05), NL (r=0.432; p<0.005), HAW (R=0.591; p<0.05), HG (r=0.0370:p<0.05) and LW(r= 0.257; p<0.005). EL (r=0.190) and TL (r=0.124) showed no significant difference with LW. This research collaborates with the work of Akpa *et al.*, (2013) that reported positive correlation between all the linear body parameters measured in their findings on the effect of age, hair type and condition score on body conformation traits in Yankasa rams. This finding is also in concord with the research of Adebayo *et al.*, (2012) that reported significant correlation between EL and TL, and HAW and BL on West African Dwarf Goat of Southern Nigeria. The significant difference recorded between EL and HG by Ebegbulem and Okon (2012) in their work titled 'Evaluation of body weight and body dimensions in breeder and grower rabbits in the humid tropical zone of Nigeria" is similar to the findings of this research. The summary statistics for body measurements in Yankasa sheep was presented in table 2. The mean BL,TL, EL, HL, NL, HAW, HG and LW were 76.74cm, 31.81cm, 11.39cm, 11.49cm, 14.68cm, 69.68cm, 75.14cm, and 30.99cm respectively. The mean LW (30.99kg) reported in this research is similar to that discovered by Umar and Kazaure (2013) in their work on the survey of live weight, sex, age and price of Yankasa sheep in Hadejia livestock market, Jigawa state.

Conclusion

This study revealed that positive relationships did exist between LW and LBMs.

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Table 1: Correlations of physical body measurements in Yankasa Sheep

	BL	TL	EL	HL	NL	HAW	HG	LW
BL	1.000	0.439*	0.350*	0.368*	0.432*	0.591*	0.370*	0.257*
TL		1.000	0.367*	0.479*	0.396*	0.625**	0.608**	0.124^{ns}
EL			1.000	0.600**	0.341*	0.490*	0.537*	0.190^{ns}
HL				1.000	0.462*	0.631**	0.577**	0.680**
NL					1.000	0.706**	0.540*	0.362*
HAW						1.000	0.638**	0.186*
HG							1.000	0.312*
LW								1.000

* = P < 0.05; ** = P < 0.01 ns= not significant

Table 2 Summary Statistics of Body Measurement In Yankasa Sheep

Body Measurement	Mean	SE	CV (%)	Min	Max
BL (cm)	76.74	0.15	17.80	74.06	90.17
TL (cm)	31.81	0.34	23.41	29.34	34.63
EL (cm)	11.39	0.23	20.16	10.64	14.37
HL (cm)	11.49	0.41	35.43	10.71	15.34
NL (cm)	14.68	0.85	62.87	9.03	14.98
HAW (cm)	69.68	0.64	56.92	65.84	73.08
HG(cm)	75.14	0.30	29.47	70.40	78.65
LW (kg)	30.99	0.87	57.88	28.41	35.60