ABG -26

Effect of Breeds on Hormonal Profile and Body Morphometric Traits of Male Rabbits

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Abstract
Description of the physical characteristics of livestock breeds is very important for developing a breeding strategy in a particular production system. Rabbits are among the potential breeds of livestock reared in Nigerian. The study was aimed at predicting live body weights of rabbits using some morphometric traits to asses' growth performance and hormone quality. Hormones and growth traits were measured on 54 matured rabbits aged 12 - 16 months and weighed between 2.20 – 2.26 kg and the data were used to determine the influence of genotypes on hormones and physiological growth performance. The breeds used are Chinchilla (CHIN), New Zealand White (NZW) and New Zealand Red (NZR). The experiment was randomized complete design with genotype as the factor of interest. Traits measured were, Luteinizing, Testosterone hormones, Body weight (BW) and Morphometric traits: Body length (BL), Breast girth (BG), Height at withers (HW),Head to shoulder (HS), Ear length (EL) and Tail length (TL).There were significant differences ($p<0.05$) among the genotypes for hormonal and growth performance evaluation studied. This result showed that breeds can influence on body weight, morphometry and hormone quality of male rabbits.

Keywords: New Zealand White, New Zealand Red, Chinchilla, rabbit, genotype

Introduction

Animal production had become a growing phase since the advent of rabbitry to boost the effective need of protein for mankind. Rabbit had done well to mankind since he needed a proportion of cereal for himself and for the production of rabbit (Bora *et al*., 2010).Rabbit s has a number of characteristics that would make them suitable as meat producing animals, especially when compared with other herbivores animals. Rabbit could contribute significantly in solving the problem of meat shortage. Meat of rabbit has low cholesterol, it has a rich essential fatty acids. Body weight and varying phenotypic traits changes through dimensional process of growth in the body conformation, shape changes, are regarded as growth strategic in rabbit. (Atchley *et al*., 1980).Body weight and body weight gains are good indicators of growth performance throughout the lifetime of small ruminants. Consequently, the weights of animals reared in the rural areas are traditionally assessed visually and by attempting to lift the animal and feel its weight (Isidahomen *et al.,* 2014).

The objective of this study is to assess of the body weight of the rabbit based on the relationship of the body weight traits with the linear body conformations.

Materials and methods

Experimental Site/Location of Study: The research was carried out at the Rabbitry Unit of the Livestock Teaching and Research Farm of Ambrose Alli University Ekpoma, Edo State. The mean ambient temperature ranges from 26^0C in December to 34^0C in February, relative humidity ranges from 61% in January to 92% in August with yearly average of about 82%. The vegetation represents an interface between the tropical rainforest and the derived savanna.

Duration of Experiment, Management and feeds of the Rabbits: A total of 54 male rabbits were used for this study. These consisted of 18 rabbits each of the genotypes were Chinchilla (CHIN), New Zealand White (NZW) and New Zealand Red (NZR). All rabbits were tagged for proper identification and subjected to the same management practice throughout the experimental period. Medication and vaccinations were carried out accordingly against stress and disease. The Rabbits were given *ad libitum* access to commercial Growers marsh containing 15.86% crude protein, 2716 Kcal/kg Metabolizable energy and clean water was given regularly. The experiment was carried out for a period of Sixteen (16) weeks.

Data collection: Hormonal evaluation*:* blood samples were collected, before, during and after the experimental period and serum testosterone and Luteinizing level were determined, using (Radioimmuno assay) RIA. Body weights and body linear measurements were taken at the commencement of the experiment and subsequently

were taken on a weekly basis for each Rabbits. Measurements were taken with the aid of a sensitive scale and a measuring tape. All measurements were taken in the morning before feeding the animals. The following parameters were considered for the experiment; Body weight(BW), Body length (BL), Breast girth (BG), Height at withers (HW),Head to Shoulder(HS), Ear length (EL), Ear Width (EW) and. Tail length (TL)

The description of the measurement is as follows;

Body weight (BW): Live weight of the animal.
Body Length (BL): The distance from the nose to the point of the shoulder.
Breast Girth (BG): Measured as body circumference just behind the foreleg.
Height at withers (HW): The distance from the base to the shoulder.
Head to shoulder (HS): The longitudinal distance from the nose to the point of attachment of the neck.
Trunk Length (TKL): The Longitudinal distance from the point of the shoulder to the point of the attachment of the tail to the body.
Ear Length (EL): The distance from the base of the attachment of the ear to the head of the tip of the ear.
Ear Width (EW): The distance from both broad ends of the ear.
Tail length (TL): The distance from the base of the tail to the body to the tip of the tail.

Statistical analysis: All data collected were subjected to one way analysis of variance (ANOVA) using the complete randomized design according Statistical Analysis System Institute (SAS, 1999). Significant differences were computed and Duncan's Multiple Range Test (Gomez and Gomez, 1984) was used to separate the means.

Table 1**:** Effect of Hormones and Body weight, morphometric traits of matured buck

Genotype	Chinchilla	New Zealand white	New Zealand red
Luteinizing (ng /ml)	0.15±0.02	0.14±0.03	0.15±0.02^{ns}
Testosterone (ng/ml)	0.15±0.02	0.16±0.01	0.15±0.02^{ns}
Body weight(kg)	2.26±0.04	2.21±0.02	2.20±0.03^{ns}
Body length (cm)	34.92±0.40	35.08±0.56	34.42±0.43^{ns}
Breast Girth (cm)	29.33±0.41^{a}	28.00±0.44^{b}	29.92±0.51^{a}
Height at wither (cm)	14.75±0.35^{a}	11.67±0.38^{b}	10.83±0.24^{b}
Head to shoulder (cm)	14.33±0.43^{a}	14.66±0.08^{a}	12.58±0.31^{b}
Ear length (cm)	11.21±0.10^{a}	10.67±0.15^{a}	7.83±0.32^{b}
Ear width (cm)	5.57±0.12^{ab}	5.37±0.05^{b}	5.64±0.08^{a}
Tail length (cm)	6.55±0.09^{b}	7.88±0.10^{a}	6.73±0.08^{b}

Means ± along the same row with different superscript are significantly different ($p<0.05$)

The Hormonal analysis is useful to know activities of hormones in the body, reproductive performance in animals could be altered by abnormality in the hormones (Omole, 1982). From this analysis it was observed that there were no significant decreased in, luteinizing hormone and testosterone hormone level in the different breeds of rabbits. The hormonal level was the same for all genotypes. This as a result of suppression of androgen production and reduction in Sertoli cell number (Scott *et al.,* 2007). Body weight and other parameters were found to have some significant ($p<0.05$) effect in this study. The breed effect was not significant on body weight and body length. The abundance of New Zealand White rabbits indicates that New Zealand white is better for breed comparisons and superiority.

In general, the results showed some differences in parameters examined. The results support the work of Chineke *et al*. (2002). With this, the genetic relationship among these populations in terms of these growth traits could be studied. Also, growth parameters are highly heritable traits, suggesting that differences among different genotypes are expected and selection based on individual performance could successfully improve these traits. The relationships among quantitative traits such as body weight, body length, ear length, tail length and limb lengths etc have been investigated among domestic rabbits (Chineke *et al.,* 2002; Isaac *et al.,* 2011; Atansuyi *et al.,* 2011; Isidahomen *et al.*, 2014). It will also serve as a tool for breeders in selecting animals destined for use as breeding stock.

Conclusions

The implication of this is that New Zealand Red and New Zealand White breeds of rabbit have high growth ability and the genetic potential to transmit desirable genes for fast growth rate. This is important in making fast genetic progress when considering growth traits.

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