

EFFECT OF GENOTYPE ON SOME REPRODUCTIVE TRAITS OF RABBITS

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ABSTRACT

A total number of twenty (20) does and ten bucks (10) were used for the study comprising of ten (10) does and five 5 bucks for each of the genotypes respectively. The study was conducted at the Teaching and Research Farm, Department of Animal Science, University of Maiduguri, Maiduguri, Borno State. Data on some reproductive traits were obtained from does over a period of six months (January-June 2020). Data obtained were; litter size at birth, gestation length, litter weight at birth, weight of doe, and weight of buck. There was significant different ($p > 0.05$) in body weight of doe with Dutch breed having highest value followed by New Zealand white. The combined Pearson correlation of some reproductive traits of two breeds of rabbit obtained a strong positive and significant correlation ($r=0.88$) between body weight of doe and gestation length. Moderate positive and significant correlation were obtained between breed and body weight of doe (BWD), Breed and gestation length (GL), and litter size (LS) and litter weight at birth (LWB) with their corresponding values of ($r=0.54$, $r=0.53$, and 0.55) respectively. This result revealed that increase in any of the traits may lead to increase in their corresponding values respectively.

KEY WORDS: Body weight, Correlation, Genotype and Reproductive traits.

INTRODUCTION

Domestic rabbits are of the descendants of *Oryctolagus cuniculus* specie that is native to the western Mediterranean basin. The rabbit was domesticated recently with most breeds being developed by humans and are not older than 300 years (Lebas *et al.*, 2012). The most strategy of any mammal is to produce offspring and thereby preserve the species from extinction. Therefore, if the high demand for meat in future years will have to be met, much of the increase in production would have to come from short cycle animal such as rabbit which have gestation period between 30-32days and a rapid growth rate that makes it ready for breeding at five (5) months of age and under good management conditions which compares favorably with the growth rate of other animals such as chicken (FAO, 2011).

The reproductive performance of an animal determines, the turn over from animal production and the ratio of its growth rate. Growth rate varies from one breed of animal to another which provides information on genetic variation which will be of help in selecting breeding stock. Litter size in rabbits varies considerably usually ranging from 6-10 kittens in domestic rabbits (Fosseyth and Hayden, 2017).

Irekhore (2017) reported that Dutch breed produced higher litter size at birth than New Zealand White. Rabbit breeds also differ extensively in litter size, growth rate and behavior. Rabbit is usually produced for meat. Fur, wool and therapeutic proteins, and numerous breeds are raised specifically as pets. The objective of the study was to determine the effects of breed on some reproductive traits of two breed of rabbits.

MATERIALS AND METHODS

The study was carried out at the Livestock Teaching and Research Farm, University of Maiduguri, Borno state. Maiduguri is situated on latitude $11^{\circ}5'N$ and longitude $13^{\circ}09'E$ and at an altitude of 354m above sea level. The area falls within the Sahelian region and is noted for its great climatic and seasonal variation. It has very short period of rainfall about 3-4months given 645.9 mm of precipitation per annum with a long dry season of about 8-9 months. The temperature could be as low as $20^{\circ}C$ during the dry cold season (October-January) and as high as $30^{\circ}C$ during the dry hot (February-May) season. Relative humidity is 5% in April and 60% in August; day length varies from 11-12 hours (Raji *et al.*, 2010).

Management of experimental stock.

The experiment was conducted with thirty (30) matured rabbit, fifteen (15) New Zealand and fifteen (15) Dutch breeds, comprising of five (5) buck (males) and ten (10) Doe (females) from each breed. The

mating ratio of 1:2 (1 Buck: 2 Doe). The rabbit were obtain within the experimental area and used for the study. Before the arrival of the rabbit, the deep litter pen were cleaned, washed and disinfected. The experimental design used for the experiment was complete randomize design (CRD). The experimental animals were tagged on the ears for easy identification. Two weeks was used for adaptation before the experiment, during the period the rabbit were vaccinated (against internal diseases). The rabbits were fed commercial grower's mash of 17%CP and ME of 2800 Kcal/kg and some green forages. Feed and water were supplied *ad libitum* throughout the experimental period.

Data Collection

The following data were collected.

1. Body weight: it was measured in (kg) using weighing balance.
2. Gestation length (GL): This was measured as the period of time between mating and kindling (birth of the young rabbits).
3. Litter size at birth (LSB): This was measured as number of kit born per doe at the single kindling.
4. Litter weight at birth (LWB): This was measured as the combined weight of kit born per single kindling.

Statistical analysis.

All the data collected were subjected to analysis using one way ANOVA and the mean separation was done with Duncan multiple range test using SAS package 2000. Pearson's correlation was used to analyze the association between body weight and some reproductive traits.

RESULT AND DISCUSSION

Effect of genotype on some reproductive traits of two breeds of rabbit

Table 1. Presents the effect of genotype on some reproductive traits of two breeds of rabbit. The results of the present study indicate that there was no significant differences ($p < 0.05$) in almost all the reproductive traits study except body weight of doe which shown significant different ($p > 0.05$) with Dutch breed having the highest values of 3.26kg followed by New Zealand white with the corresponding values of 1.87kg. The present study is not in agreement with the findings of Onasanya *et al.* (2017) and Ologbose *et al.* (2020) who observed that higher values of body weight with bucks than the does.

The non-significant difference obtained in litter size at birth was similar to the findings of Kumaresan *et al.* (2011) and Apori *et al.* (2015) recorded similar report on litter size, gestation length and kindling interval for New Zealand White and Dutch breed. This may be as a results of similar genetic backing up of the two genotypes or as a results of genotype by environment interaction. Kabir *et al.* (2012) and Irekhore, (2007) observed similar investigation who reported that Dutch does produced significantly higher litter size at birth than the New Zealand White does. Hassan and Ciroma, (2012) and Egena *et al.* (2012) also observed similar study with the following findings with the doe having higher body weight than buck. Akpa (2018) obtained different results with no significant ($p > 0.05$) different in body weight between doe and bucks.

Table 1: Effect of Genotype on some reproductive traits of two breeds of rabbit.

Genotype	BWB	BWD	LSB	GL	LWB
New Zealand white	1.72 ^{NS}	1.87 ^b	3.60 ^{NS}	31.70 ^{NS}	81.50 ^{NS}
Dutch	1.77 ^{NS}	3.26 ^a	3.50 ^{NS}	31.70 ^{NS}	81.50 ^{NS}

Where: a, b Values within each group with different superscripts differ in significantly ($p < 0.05$); NS = Not significant ($p > 0.05$), BWB= Body weight of buck, BWD= body weight of doe, LSB= litter size at birth, GL =Gestation length, and LWB = Litter weight at birth.

Combined Pearson correlation of some reproductive traits of two breeds of rabbit

Table 2, presented the combined Pearson correlation of some reproductive traits of two breed of rabbit. Strong significant ($p > 0.01$) and positive correlation ($r=0.88$) was observed between body weight of doe and gestation length this may indicated that as the body weight of doe increase and gestation length also increase. positive significant and moderate correlation were observed between breed and body weight of

doe, breed and body weight of buck, litter size at birth and litter weight at birth, with the corresponding values of $r=0.054$, 0.53 and 0.55 respectively.

Vincente *et al.* (2015) and Argente *et al.* (2010) observed that increase in litter weight at birth will lead to increase in litter size and vice versa which is similar with this study. There was also significant correlation observed between litter size and litter weight ($r=0.55$), breed and body weight of buck ($r=0.54$), and breed and gestation length ($r=0.53$). This indicate that as the body weight of doe increase also gestation length increase.

Low, not significant and positive correlation were observed, in some parameters these indicate that increase in one parameter may not necessarily lead to increase in the other parameters. Low negative and non-significant correlation were observed between body weight of buck (BWB) and litter size at birth (LSB), and body weight of buck and litter weight at birth, these may indicate that increase in one trait may lead to decrease in the other parameters. These findings are in line with Adeyinka *et al.* (2017).

Table 2: Combined Pearson correlation of some reproductive traits of two breed of rabbit

Parameter	Breed	BWB	BWD	LSB	GL	LWB
breed	1					
BWB	0.306	1				
BWD	0.545*	0.023	1			
LSB	0.242	-0.018	0.382	1		
GL	0.535*	0.178	0.880**	0.369	1	
LWB	0.285	-0.074	0.384	0.555*	0.450	1

Key: * = Significant at 0.05; ** = highly Significant at 0.01; BWB = Body weight buck; BWD = Body weight doe; LSB = Litter Size at birth; LWB = litter weight at birth; GL= gestation length.

CONCLUSIONS

The effects of genotype on some reproductive traits of two breeds of rabbit revealed non-significant difference ($p > 0.05$) in almost all the trait studied except body weight of doe with Dutch breed having the highest value than New Zealand white. The combined Pearson correlation of some reproductive traits of two breeds of rabbit showed a strong significant ($p < 0.01$) and positive correlation between body weight of doe and gestation length. This indicate that as the body weight of doe increase the gestation length also increase and will lead to heavy litter size and litter weight. Farmers should select Dutch breed for reproduction because it has good reproductive performance and large litter size than New Zealand white in the study area.

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