

MLP -10

Assessment of New Zealand White and American Chinchilla Rabbits for Reproductive Traits in a Derived Savannah Ecological Zone of Nigeria

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Abstract

The objective of this study was to assess the reproductive traits of New Zealand White (NZW) and American chinchilla (CH) rabbits reared in a derived savannah ecological zone of Nigeria under the same housing, feeding and management practices. A total number of 20 rabbits, which comprises 8 NZW and 8 CH does and two bucks each of the same breed were used for mating the does during the study which lasted for 5 months. Two (2) parities were observed for reproductive traits such as litter size at birth (LSB), litter birth weight (LBW), weaning weight (WW), gestation gain (GG), survival weight to weaning (SW) and gestation length (GL) in each female breed. Analyzed results showed a significant difference ($p < 0.05$) for reproductive traits. American chinchilla was found to have the better averages in LSB at first kindling having a value of six (6), LBW (47.87g), WW(667.6g), SW (60%) while the NZW had a better litter weight gain (LWG, 633.20 g) than CH. At second kindling CH showed superiority in weight of the dam (WD, 2.38g), gestation gain (GG, 0.34g), survival rate to weaning (SW, 100%) and litter weight gain over NZW rabbit. No significant difference was observed for growth rate between the two breeds except at 21weeks. These findings revealed that CH and NZW can be successfully used for breeding in the derived savannah ecological zone of Nigeria based on their reproductive traits.

Keywords: Assessment, reproductive traits, savannah ecological zone, rabbit breeds

Introduction

In recent years, there have been many advances in livestock production with potential applications in the tropics. Unfortunately, most of these advances have failed to satisfy the basic needs of rural populace for secured food supplies, particularly that of animal origin. With increase in human population especially in developing countries like Nigeria, the supply of adequate animal protein from the five principal livestock species (cattle, sheep, goat, swine and poultry) have become impossible hence the interest in micro livestock such as rabbit because its production has enormous potential in alleviating the problem of animal protein supply in developing economy (Fayeye and Ayorinde, 2003). The important attributes of rabbits as micro livestock include small body size, short gestation period, ability to utilize less feed, rapid growth, potential for genetic improvement and production of high quality and useful by product (Egboet *et al.*, 2001; Herbert, 2011). Apart from high temperature that might pose undue stress on the animal, rabbit production can significantly contribute to man's need at all times.

The objective of this study was to assess the reproductive traits of New Zealand White and American Chinchilla rabbits and it was conducted at the Teaching and Research Farm Ladoke Akintola University of Technology, Ogbomoso.

Materials and Methods

The experiment was conducted at Rabbitry section of Teaching and Research farm of Ladoke Akintola University of Science and Technology, Ogbomoso, Oyo state, Nigeria. The total number of animal used for the experiment were 20 rabbits, age 16 weeks, 8 does and 2 bucks for New Zealand white as well as for American chinchilla rabbit. Feeding and other management practices are the same. The experiment lasted for 5months.

Data obtained was subjected to analysis using student t-test.

Results and Discussion

The mean values of reproductive traits of New Zealand White (NZW) and American Chinchilla rabbits (CH) at first and second kindling's are depicted in Table 1. There was significant $p < 0.05$ variations between the two breeds for some reproductive parameters. At first kindling, litter size at birth (LSB) for CH was superior to its NZW counterpart however litter birth weight (LBW) for NZW rabbit was higher than CH rabbit. The weaning weight (WW) was also higher with NZW having 667.6g compared to that of CH with 259.5g. Survival rate to weaning percentage and litter weight gain (LWG) of CH rabbit were found to be inferior to that of NZW rabbit. At

the second kindling, weaning weight, weight of dam, gestation gain, survival to weaning and litter weight gain showed superior significant values in the CH compared to NZW whereas litter size at birth, litter birth weight and gestation length did not show any significant variations among the two breeds.

Table 1: Mean values of reproductive traits of Chinchilla and New Zealand White rabbits in two parities.

Variables	First Kindling		Second Kindling	
	CH	NZW	CH	NZW
LSB	6.00 ^a ±0.00	3.67 ^b ±0.33	5.00±0.50	6.00±0.50
LBW(g)	38.60 ^b ±0.37	47.87 ^a ±1.06	56.09±1.21	52.67±2.27
WW(g)	259.5 ^b ±129.8	667.6 ^a ±168.1	975.2 ^a ±20.23	777.0 ^b ±13.88
WD(kg)	2.25±0.06	2.16±0.04	2.38 ^a ±0.02	2.08 ^b ±0.02
GL(days)	30.33±0.44	31.33±0.33	30.33±0.17	30.00±0.58
GG (kg)	0.25±0.01	0.20±0.05	0.34 ^a ±0.01	0.14 ^b ±0.01
SW (%)	27.77 ^b ±13.88	60.00 ^a ±15.28	100.0 ^a ±0.00	43.33 ^b ±6.01
LWG(g)	244.5 ^b ±122.3	633.2 ^a ±159.6	919.1 ^a ±19.39	615.02 ^b ±40.24

^{ab} Means in the same row having different superscripts are significantly (p<0.05) different. Note CH= chinchilla, NZW= New Zealand white rabbit, LSB=litter size at birth, LBW= litter birth weight, WW=weaning weight, WD= weight of the dam, GL=gestation length, GG=gestation gain, SW=survival weight, LWG= litter weight gain.

These results on reproductive traits at first and second kindling showed significant differences between the breeds which is an indication that the breeds have different genetic potential, this is in agreement with Addass *et al.* (2010) who reported that variability differences may be due to inherent breed differences. The findings at first kindling is in agreement with the results of Yahaya (1993), who reported higher litter size at birth for CH than for NZW which was however contrary to Rubio-Rubio *et al.* (2004) who reported higher litter size in favour of NZW. Also, the average birth weight increased with increase in litter size, this corroborates the findings of Poigner *et al.* (2000). The average litter weight gain at first kindling showed that NZW rabbits which had a lower litter size at birth had a higher litter weight gain unlike CH rabbits which had a higher litter size and lower litter weight gain. There was however, no significance difference in the weight of the dam, gestation length and gestation gain during the first kindling.

At second kindling, the average weaning weight increased as expected with Chinchilla rabbits showing superiority over New Zealand rabbits. This could be due to number of weaned litters as a result of parity, which was in line with Addass *et al.* (2010). The increase in weaning weight could also be attributed to milk production which can also be linked to parity which was in agreement with the findings of Lukefahr *et al.* (1981) who reported positive relationship between milk yield and litter weight between breeds. As expected, the average litter weight gain increased more with CH than the NZW rabbits. The survival rate to weaning percentage in relation to the litter weight has CH rabbits having a higher birth weight and a higher survival rate to weaning percentage while NZW rabbits had a lower birth weight and consequently a lower survival rate to weaning percentage. This corresponds to the first kindling and established the observation made by Oke *et al.* (2010). Non-significance in litter size at birth, average litter birth weight and gestation may be due to the similarities in reproductive traits between the breeds.

Conclusion and Recommendation

Considering the results, it shows that both CH and NZW can be reared in this environment but further studies needs to be carried out in terms of adaptability to changes in climatic variations.

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