

ABG -25

Effect of Genotype on the Hematology of Matured Male Rabbit

C.E. Isidahomen, and I.B. Amaza,

Department of Animal Science, Ambrose Alli University, Ekpoma – Nigeria

Corresponding author: C.E. Isidahomen; E-mail: ebicley2k@yahoo.com

Abstract

Thirty-six (36) breeding bucks aged 12 - 16 months and weighed between 2.20 – 2.26 kg and the data were used to determine the influence of genotypes on Hematological parameters. These consisted of 12 rabbits New Zealand red, New Zealand white and chinchilla each of rabbit genotypes. There were significant ($p < 0.05$) differences between the genotypes in the mean values of White blood cell (WBC) count which range ($4.80-6.31 \times 10^3/\mu$), Red blood cell (RBC) count ($5.66-6.45 \times 10^6/\mu$), packed cell volume PCV (34.62 - 35.53%) and hemoglobin (Hb) concentration, mean corpuscular volume (MCV), mean corpuscular haemoglobin MCH (14.30-16.45 pg) mean corpuscular haemoglobin concentration (MCHC). However, the New Zealand Red was significantly superior in some of the parameters examined. Also, WBC was significantly ($p < 0.05$) higher in the New Zealand Red. The results on hematological characteristic of the rabbit genotype could be used in the classification of rabbit into a genetic group for adaptive and product purpose.

Keywords: Male rabbit, genotype, hematology

Introduction

Rabbits exhibit an exceptionally high phenotypic diversity; more than 200 breeds are recognized worldwide (Chorro *et al.*, 2009). This diversity is utilized for a wide variety of laboratory studies. In a few cases, however, this variability leads to a difference in the normal values of important physiological parameters, such as haematologic and biochemical parameters (Ozkan *et al.*, 2012). Haematological studies represent a useful process in the diagnosis of many diseases as well as investigation of the extent of damage to the blood. The blood transports or conveys nutrient and materials to different parts of the body. Therefore, whatever affects the blood; drugs, pathogenic organism or nutrition will certainly affect the entire body adversely or moderately in terms of health, growth, maintenance and reproduction (Aduku and Olukosi, 2010). A variety of factors can affect the haematological and biochemical parameters in animals, including the breed, gender age, reproductive status and seasonal variations (Onyeyili *et al.*, 2007).

This study determined the influence of genotypes on hematological parameters of matured male rabbits

Materials and Methods

A total of 36 rabbits were used for this study. These consist of 12 rabbit's breeds each. The genotype is America Standard Chinchilla (CHIN), New Zealand Red (NZR) and New Zealand White (NZW). All rabbits were subjected to the same management practice throughout the experimental period. Medication was also carried out accordingly against stress and disease. The experiment was carried out for a period of sixteen (16) weeks. The rabbits were fed *ad libitum* with grower's mash containing 16.80% Crude protein, 2823 Kcal/kg Metabolizable Energy will be fed from 15 – 28 weeks of age. Clean water was supplied continuously *ad libitum* throughout the experiment.

Blood sample was collected before and after the end of the experiment. The bucks were fasted overnight and blood was collected. Specimen for haematological studies was collected separately in a bottle containing di-potassium salts of ethylene diamine tetra-acetic acid (EDTA) an anticoagulant. The blood samples were analysed using routinely available clinical methods. These include packed cell volume (PCV) or haematocrit, red blood cell (RBC) count and white blood cell (WBC) count and haemoglobin concentration (Hb), using Witro's micro-haematocrit, improved Neubauer haemocytometer and cyanomethaemoglobin methods, respectively. The erythrocyte indices, mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCHC) were computed according to Jain (1986).

All data obtained were subjected to analysis of variance to investigate the effect of genotype/breed on haematological using the General Linear Model of SAS (1999). Duncan's Multiple Range Test was used to separate the means that are significantly difference (Gomez and Gomez, 1984).

Results and Discussion

The result of the haematological indices are presented in table 1. There was significant difference ($p < 0.05$) among genotypes in the mean values for white blood cells counts, red blood cells counts, packed cell volume (PCV) favour the New Zealand Red breeds/genotype. The New Zealand Red genotype had significantly ($p < 0.05$) higher WBC ($6.31-4.80 \times 10^3/\mu$), RBC ($6.45-5.66 \times 10^9/\mu$) and did not agree with the reports of (Kim *et al.*, 2002; Wells *et al.*, 1999). The mean values obtained in the present study falls within the normal physiological range (Mitruka and Rawnsly, 1981; Kerr, 1989; Njidda and Isidahomen, 2009). The higher PCV, values in the New Zealand Red genotype is also an indication that breeds/genotypes had superiority gene in PCV compared to that of the other genotype. This could be a boost to the growth and productive life of other genotype/breeds.

Conclusion

According to the results of the current experiment, it was found that some parameters examined had an effect on the genotype/breed on Haematology.

Table 1: Effect of Haematology as affected by Genotype traits of matured buck

Genotype	Chinchilla	New Zealand white	New Zealand red
White blood cells ($\times 10^3/\mu$)	4.80 \pm 0.03 ^b	4.80 \pm 0.02 ^b	6.31 \pm 0.03 ^a
Red blood cells ($\times 10^9/\mu$)	5.71 \pm 0.01 ^b	5.66 \pm 0.00 ^c	6.45 \pm 0.01 ^a
Packed cells Volume (%)	34.90 \pm 0.04 ^b	34.62 \pm 0.03 ^c	35.53 \pm 0.05 ^a
Hemoglobin (g/dl)	9.65 \pm 0.04 ^a	9.48 \pm 0.03 ^b	8.54 \pm 0.02 ^c
Mean Corpuscular Volume (fl)	61.53 \pm 0.04 ^a	61.28 \pm 0.03 ^b	56.18 \pm 0.06 ^c
Mean Corpuscular Hemoglobin (pictogram)	16.38 \pm 0.05 ^a	16.45 \pm 0.05 ^a	14.30 \pm 0.08 ^b
Mean Corpuscular Hemoglobin Concentration (g/dl)	27.60 \pm 0.06 ^a	27.20 \pm 0.04 ^b	24.58 \pm 0.06 ^c
Platelet ($\times 10^6/\mu$)	220.75 \pm 0.13 ^a	214.25 \pm 3.18 ^b	220.58 \pm 0.15 ^a

Means in the same row with different superscripts are significantly different ($p < 0.05$)

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