Hematological Values of out Bred Domestic Rabbits in Eastern Nigeria

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Summary

There is a dearth of relevant information in general about certain production parameters of domestic rabbits in general in eastern Nigeria. Thus some basic hematological parameters of young and adult out bred domestic rabbits, from villages in eastern Nigeria, were determined using standard methods in hematology. Individual values of Hb and PCV were very variable. The Hb values were 6.50 - 17.80 g% (mean 11.20 ± 1.59 g%) in young rabbits and 9.50 - 16.20 g% (mean 11.50 ± 1.61 g%) in adult rabbits. The mean PCV was 33.39 ± 3.63% (range 25 - 42%) in young rabbits and 30.37 ± 4.45% (range 22 - 38%) in adults. The difference between PCV values in young and adult rabbits was not significant. The total WBC counts were 3371 - 19400 c/µl (mean 8512.4 ± 3914.87 c/µl) in young rabbits and 4320 - 20200 c/µl (mean 7914 ± 3090 c/µl) in adults. The majority of white blood cells were lymphocytes in both young and adult rabbits. Eosinophils, basophils and monocytes were generally rare. The results show that the basic hematological values (PCV, Hb and WBC) of out bred domestic rabbits in Nigeria differ from those reported for other rabbits in general. This observation is important for scientific research and diagnostic work using this breed of rabbits.

Résumé

Valeurs hématologiques de lapins croisés domestiques du Nigeria oriental

Il y a peu d'informations relatives à certains paramètres de production et de santé des lapins domestiques au Nigeria oriental. Certains paramètres hématologiques de lapins (jeunes et adultes), achetés dans des villages du Nigeria oriental, ont été déterminés avec des méthodes standard d'hématologie. Les valeurs de Hb étaient de 6,50 à 17,80 g% (moyenne de 11,20 ± 1,59 g%) pour les jeunes lapins, et de 9,50 à 16,20 g% (moyenne de 11,50 ± 1,61 g%) chez les adultes. La valeur moyenne de l'hématocrite était de 33,39 ± 3,63% (25 - 42%) chez les jeunes lapins et de 30,37 ± 4,45% (22 - 38%) chez les adultes. La différence entre ces valeurs n'était pas significative. Le nombre total de leucocytes variait entre 3371 et 19400 c/µl (moyenne 8512 ± 3914,87 c/µl) chez les jeunes lapins contre 4320 et 20200 c/µl (moyenne 7914 ± 3090 c/µl) chez les adultes. Les éosinophiles, basophiles et monocytes étaient généralement rares. Ces résultats montrent que les valeurs hématologiques (hématocrite, Hb et leucocytes) des lapins croisés domestiques du Nigeria sont différentes de celles généralement signalées pour les lapins.

Introduction

Hematological values in general are commonly used in disease diagnosis and assessment of the impact of hemoparasite infections and hematophagous nematode infections in domestic animal health practice (9). Low PCV and Hb values are associated with anemia while the total and differential leukocyte counts may reflect the level of host reaction in its attempt to combat the infection. Hematological values have been determined for various breeds of domestic livestock, except domestic rabbits, in West Africa in general and Nigeria in particular (7, 8). Hematological values have been documented for pets (10) and some breeds of mice (5) in other places. In Nigeria rabbits are currently being used as a valuable source of animal protein in rural communities (4) and for scientific research in academic institutions. Their small sizes (Plate 1), with maximum weight less than 1.5 kg each, make them convenient rations for one meal in a small family and invaluable laboratory animals for scientific research.

Plate 1: Out bred domestic rabbits in eastern Nigeria.

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However their production and productivity are seriously retarded by parasitic diseases for example liver coccidiosis (6) which may be reflected in some hematological values. Yet very little has been documented about rabbit health in Nigeria in general and in the eastern region in particular. Thus, there is virtually no available information about hematological values of outbreed domestic rabbits in eastern Nigeria.

Material and methods

Seventy-two young out bred domestic rabbits aged between 8 and 12 weeks and 29 adult rabbits of the same strain, aged 8 - 20 months, were sampled from six separate villages in eastern Nigeria (Plate 1).

About 2 ml of blood were collected from the marginal ear vein of each rabbit through venipuncture with a sterile sharp needle into a 5 ml specimen bottle containing EDTA anticoagulant. The PCV, Hb, total and differential white cell counts were evaluated using recommended methods (2, 11). Mean values of the different parameters were compared between sexes within the same age group and between age groups of host using the student t-test. P values less than 0.05 were considered significant.

Results

Table 1 shows the summarized hematological values of out bred domestic rabbits in eastern Nigeria.

The Hb values were 6.50 - 17.80 g% (mean 11.20 ± 1.59 g%) in young rabbits and 9.50 - 16.20 g% (mean 11.50 ± 1.61 g%) in adults (Figure 1).

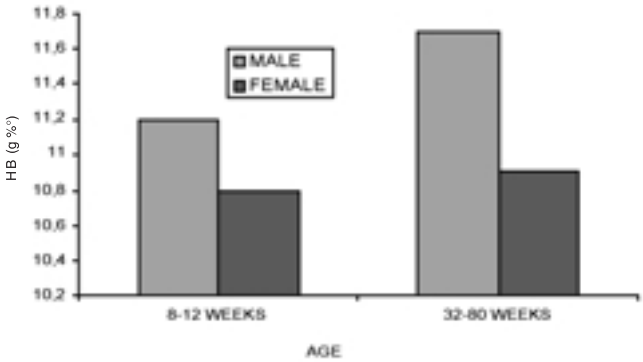

Figure 1: Hb values for young and adult rabbits.

The individual values were generally variable. There was no significant difference in the mean values of this parameter between young and adult rabbits. The majority of white cells were lymphocytes in young rabbits (mean 60.86 ± 11.03%) and in adult rabbits (mean 67.39 ± 10.97%).

Similarly there was no significant difference in the total WBC counts between the two age groups (Figure 3). Values ranged from 3371 – 19400 c/µl (mean 8012.4 ± 3914.87 c/µl) in young rabbits and 4320 – 20200 c/µl (mean 7914 ± 3090 c/µl) in adults. The PCV ranged from 25 - 42% (mean 33.39% ± 3.63) in young rabbits and 22 - 38% (mean 30.37% ± 4.45) in adult rabbits (Figure 2). The difference in mean PCV values between these age groups was not significant. Eosinophils, monocytes and basophils were generally rare.

Table 1

Mean (sd) hematological values of out bred domestic rabbits in Eastern Nigeria

Age (wks)	Sex	Hb*	PCV**	VWBC***	Differential count**				
					N	L	E	M+	B
8-12	M	11.23 (±1.73)	33.62 (±3.76)	9294.17 (±3974)	39.92 (±11.32)	59.76 (±11.44)	0.24 (±0.59)	0.05 (±0.23)	0.03 (±0.16)
8-12	F	11.16 (±1.03)	32.5 (±3.06)	6167.1 (±2715)	35.46 (±9.14)	64.08 (±9.41)	0.46 (±0.88)	0	0
32-80	M	11.68 (±1.74)	31.17 (±4.55)	8678.24 (±3545)	34.29 (±11.13)	64.79 (±11.01)	0.93 (±1.21)	0	0
32-80	F	10.80 (±0.93)	29.00 (±4.13)	6615 (±1509)	22.50 (±4.80)	76.50 (±3.70)	1.00 (±1.16)	0	0
All young		11.2 (±1.59)	33.39 (±3.63)	8512.4 (±3915)	37.78 (±10.9)	60.86 (±11.03)	0.29 (±0.67)	0.04 (±0.20)	0.02 (±0.14)
All adults		11.50 (±1.61)	30.37 (±4.45)	7914 (±3091)	31.67 (±11.14)	67.39 (±10.97)	0.94 (±1.16)	0	0

sd= standard deviation; N= neutrophils; M+= monocytes; M= males; L= lymphocytes; B= basophils; F= females; E= eosinophils; *= g%; **= %; ***= c/µl.

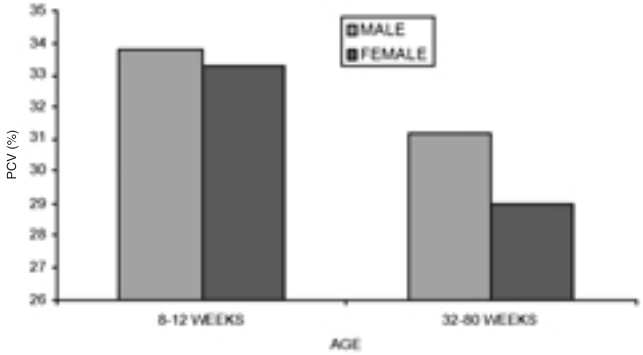

Figure 2: PVC values for young and adult rabbits.

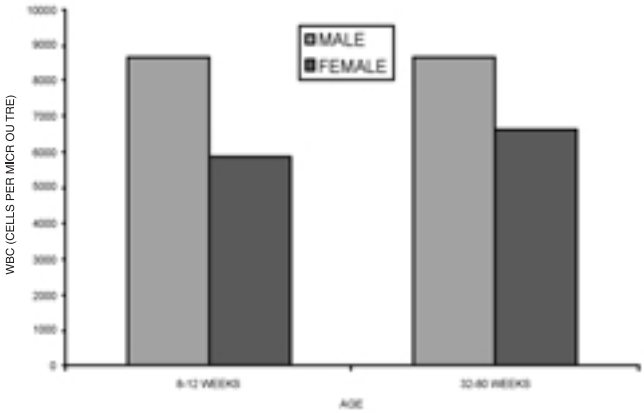

Figure 3: Wbc values for young and adult rabbits.

Discussion

The present results underscore the importance of determining hematological values of the various breeds of tropical domestic livestock. This is of practical importance in tropical animal health and production since they do not compare favorably with those of temperate breeds of rabbits (8). The hematological values of these rabbits differ from those usually quoted for other rabbits (1, 3, 11). This suggests that hematological data from one breed of rabbits may not be generally useful as reference values for all other breeds especially in different ecological zones. Thus hematological data from rabbits should be used with caution. Variations in hematological values between tropical and temperate breeds of sheep and goats have also been reported (7). Furthermore within-breed variations in hematological values have been observed in animals in the same tropical zone (3). There is wide within-breed variation illustrated in out bred domestic rabbits in the present work. Despite the individual variability in hematological values of these rabbits there were no significant differences in the mean values of Hb, PCV and total white blood cell count of young and adult rabbits.

These observations are useful in disease diagnosis and therefore it is important to determine the factors responsible for any individual variations. Photoperiod may be associated with diurnal variation in values of hematological parameters in rabbits (11). Peak values occur in the early afternoon followed by a rapid decline. Since the pedigrees of domestic rabbits in eastern Nigeria are not well known the causes of variation are still unclear. Out bred domestic rabbits in eastern Nigeria are known to be usually infected with hepatic coccidiosis (6) and this could also influence fluctuation and individual variation in hematological values. However, the present study has provided some baseline data that may be useful in the assessment of the impact of some diseases of rabbits and as reference values in scientific research in eastern Nigeria.

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