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HEMATOLOGICAL CONCENTRATION AND MINERAL PROFILE OF YOUNG GROWING CAMELS (*CAMELUS DROMEDARIUS*) IN NORTH WESTERN KANO STATE, NIGERIA

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ABSTRACT

*Hematological and Mineral parameters were determined from nine (9) one humped camels (*Camelus dromedarius*). The animals selected for the study were under traditional system of management. In comparison to other results of previous researches, the hematological indices of camels in the study area characteristically showed that Red Blood Cell, Packed Cell Volume and Mean Corpuscular Hemoglobin Concentration (13.12%, 49.11% and 34.46% respectively) were significant. The Mineral profile indicated a significant concentration of Magnesium (2.84mg/100ml) and Sodium (124.04Meq/l) respectively. In conclusion, information on hematological constituents and mineral profile of camel have been generated. Such information might be helpful for specialists to investigate for their roles in the camels' clinical and other findings which may help in developing a database.*

Key words: Blood, Hematological, Minerals, Camels, Kano

INTRODUCTION

One humped camel (*Camelus dromedarius*) or dromedary is well known for its tolerant to harsh environment such as what is obtainable in the extreme northern part of Nigeria. This animal sustains productivity in an environment that is not suitable for other animals to survive, (Wilson, 1988). Availability of quality feeds and water are the most important requirements for successful livestock production. However, camels can do well with low quality feeds and inadequate water supply (Yagil, 1986). Documents on the Haematological indices of one humped camels (*Camelus dromedarius*) in the Sudan Savannah zone are limited. There are scanty or few haematological records of one humped camel (*Camelus dromedarius*). The present study was conducted to come – out with an information on haematological values of camels owned by migratory camel owners. Data obtained from this study will contribute in many ways especially to the researchers interested in working on camels found in the Sudan Savannah and Sahelian zones of Northern Nigeria (Ghude, 2014).

MATERIALS AND METHOD

Experimental Animals

One humped camels (*Camelus dromedarius*) were used for the experiment. A total number of nine (9) camels were used for the blood collection to determine the Haematological parameters and Mineral Profile of one humped camels (*Camelus dromedarius*) in north western Kano State, Nigeria. The animals used to conduct this experiment were under free range and were apparently found to be healthy and free from disease infection.

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Completely randomized design – Factorial (CRD – Factorial 3 x 3). The camels were grouped in to three (A, B and C) with three camels each and every camel is serving as replicate

Collection of blood samples:

Blood samples were collected from jugular vein in two sets. Fifteen (15ml) were collected each. The samples were taken in an EDTA bottles, packed and transported to the laboratory for analysis.

Laboratory analysis of Haematological parameters and Mineral Profile

The concentration of Red Blood Cell, Haemoglobin, Packed Cell Volume, Mean Corpuscular Volume, Mean Corpuscular Haemoglobin, Mean Corpuscular Haemoglobin Concentration, Lymphocyte, Neutrophils, Eosinophil, Monocytes and Basophils while the concentration of Magnesium, Phosphorous, Potassium, Sodium and Iron were determined using the procedures of AOAC, (2000).

Statistical analysis:

Data were analysed by one way ANOVA, using GLM procedure of SAS (Goodnight *et al.*, 1986) and Duncan's multiple range test was used to detect significant differences among means

RESULTS AND DISCUSSION**Haematological Parameter of Adult Camel (*Camelus dromedarius*)**

The haematological values of adult camel (*Camelus dromedarius*) are presented in Table 1.

The report from the present study indicated that the values of Red Blood Cell (RBC) as 13.12% from group B. This is in agreement with the report of Albusadah, (2000) who presented a value of 13.21%. The concentration of Haemoglobin was 17.45% from group C. This is similar with the report of Ouajad and Kamel (2009) who reported 17.38% for dromedary camels under free range system. The level of Haemoglobin concentration in camels may be attributed to the sedimentation and various functions of the blood vessels to convert nutrients from feeds into important physiological functions. Packed Cell Volume (PCV) recorded a value of 49.11% (group C) from the present study. However, Values for PCV (48.67%) as reported by Farooq *et al.*, (2011) are in accordance with this report. Values for Mean Corpuscular Volume (MCV) from the present study were 85.91pg (group A). This value recorded from this study is in agreement with the report of Soni and Aggarwala (2008) who reported 85.16pg for males and 87.12 females respectively. The variation as in the report of Soni and Aggarwala (2008) and Ghude, (2014) may be as a result of the various physiological functions performed by the female camels. The values of Mean Corpuscular Haemoglobin (MCH) were presented as 86.34pg from group B. Differences due to sex in the blood indices of adult camels, on the other hand, had not been observed by (Farooq *et al.*, 2011). The Mean Corpuscular Haemoglobin Concentration (MCHC) values of this study is in agreement with the work of (Hassan *et al.*, 2008) who reported 33.89pg and 34.27pg for males and females while this report presented from group A was 34.46pg respectively. Soni and Aggarwala (2008) reported that MCHC in camels is generally over 40% which considerably in excess of the range of 30 – 36% common to animals with the discoid erythrocytes. However, the findings of this study revealed that the values of Lymphocytes were 48.43% (group B). Soni and Aggarwala (2008) also reported a lower value of 43.21% for female camels. From group B, Neutrophils had a value of 42.67%. This value for Neutrophils as reported from the present study is in agreement with the reports of Ouajad and Kamel (2009) who reported 41.98%; Farooq *et al.*, (2011) who reported 42.43% and Hassan *et al.*, (2008) who reported 42.87% respectively. Eosinophils had a value of 8.98% from group A which is in agreement with the reports of Farooq *et al.*, (2011) who presented 8.67%. From



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group C, values of Monocytes was 14.96% and Basophils from group A was 1.51% respectively. The report of the present study compared to that of Hassan *et al.*, (2008); Soni and Aggarwala (2008) and Ouajd and Kamel, (2009) had a relatively comparative values respectively. All the functions of this specie (camels) are seen to be adapted to desert environment which is characterized by little water and poor feed, these may be a reason for its fluctuations in haematological, nutritional and physiological status, Jimale *et al.*, (1998).

Table 1: Haematological Parameter of Adult Camel (*Camelus dromedarius*)

Parameters	A	B	C
Red Blood Cell (%)	12.33	13.12	12.84
Heamoglobin (%)	14.53	16.70	17.45
Packed Cell Volume (%)	44.07	45.14	49.11
MCV (pg)	85.91	83.37	82.55
MCH (pg)	81.14	86.34	85.73
MCHC (%)	34.46	32.67	32.63
Lymphocytes (%)	46.62	48.43	45.71
Neutrophils (%)	42.62	42.67	42.07
Eosinophils (%)	8.98	8.97	8.45
Monocytes (%)	12.84	14.52	14.96
Basophils (%)	1.51	1.33	1.34

Mineral Profile of Adult Camel (*Camelus dromedarius*)

The values for Magnesium (Mg) from the present study revealed 2.84mg/100ml from group C. This value is in agreement with the report of Hassan *et al.*, (2008) who reported 2.89mg/100ml and Al-Sultan, (2008) who reported 2.76mg/100ml respectively. The reports of Kuria *et al.*, (2006) who obtained 3.91 mg/100ml for Phosphorous are in agreement with the values (3.74mg/100m from group B) of the present study. Al-Sultan (2008) reported that increase in the concentration of calcium and phosphorus during the green season may be attributed to the availability of plants rich in minerals (ash content) during the wet season. Moreover, it has been reported that animals kept under natural range grazing could obtained their phosphorus requirement during the wet season Al-Sultan, (2008). Potassium recorded a relatively lower value (6.89Meq/l) from group B compared to most of the authors. Albusadah, (2007) reported 7.94Meq/l from the Sudanese camels kept under free range system of management. The values (8.14Meq/l) reported by Kuria *et al.*, (2006) indicated a higher concentration of Potassium obtain from Kuwait. Values for Sodium may be considered one of the most important minerals in camels due to the concentration of salt load in the hump as reported by many authors. Group B presented 125.05Meq/l for Sodium which indicated a relative value compared to the report of Albusadah, (2007) who presented the values of Sodium as 124.68Meq/l and Kuria *et al.*, (2006) who reported 125.13Meq/l respectively. According to Ouajad and Kamel (2009), browse and pasture quality and quantity are influenced by seasonal changes and rainfall which in turn could influence the nutritional status and consequently in the blood constituents of dromedary camels. The values for Iron 57.71µg/100ml from group C of the present study is less than what was obtained from previous studies of Soni, and Aggarwala, (2008) who reported the values for Iron as 58.24µg/100ml. The variation in the values presented may not have any effect on the performance of the animals. These, however, may be due to the changes in environmental conditions, stress, nutrition, health status among other factors.

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Parameters	A	B	C
Mg (mg/100ml)	2.41	2.42	2.84
P (mg/100ml)	3.67	3.74	3.48
K (Meq/l)	5.28	6.89	6.05
Na (Meq/l)	123.10	125.05	124.42
Fe (µg/100ml)	56.91	57.10	57.71

CONCLUSION

From the results of this study, the information might be helpful for specialists to search for the role of these various constituents. However, where there is little variations between the values presented from the findings of previous workers in other regions of the world may be attributed to the geographical location, feeding and water management, breed differences and or physiological functions and determinant procedures.

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