

## ZINC VALUES AND RED BLOOD CELL COUNTS OF CAMELS (*CAMELUS DROMEDARIUS*) IN SAUDI ARABIA

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### ABSTRACT

Concentrations of serum zinc (Zn) were determined in the blood samples collected at the time of slaughter from 50 camels belonging to different breeds, age groups and both sexes. The whole blood was also used for Red blood cell (RBC) counts. In different age groups of 5-7, 8-10 and above 10 years, the mean level of serum zinc ranged within normal range  $101.58 \pm 19.79$ ,  $99.00 \pm 16.30$  and  $99.21 \pm 21.03$  mg/100 ml, respectively. The mean values of RBC count in Group 1, 2 and 3 were  $7.09 \pm 1.23$ ,  $7.11 \pm 1.34$  and  $7.52 \pm 1.62 \times 10^{12}/L$ , respectively. This report is considered as the first of its type in Saudi Arabia.

**Keywords:** Camels, zinc values, Saudi Arabia

### INTRODUCTION

Camels can withstand desert environment, survive for long period without water and make efficient use of various roughages. Pica or ingestion of foreign bodies is strange grazing habit picking metallic objects and sands (Bansal *et al.*, 1971; Haekmati *et al.*, 1978; Gameel *et al.*, 2000). The diet of camels which contain plants, herbs, grasses and shrubs eaten in different seasons have been found nutritive (Wardeh, 1990). Moreover, minerals, vitamins and enzymes were found in most of these diets. Zinc (Zn) is a component of several enzyme system as well as carbonic anhydrase located in the red blood cells and parietal cells of the stomach and is related to the transport of the respiratory carbon dioxide and the secretion of hydrochloric acid by the gastric mucosa (Blood and Radostits, 1989). Zinc deficiency occurs rarely in ruminants and causes parkerkeratosis, alopecia, wool eating, abnormal hoof growth and lameness and unthriftiness. Normal Zn levels in the blood of camels has been reported from different countries, among these are Egypt, Sudan, Ethiopia and India (Abdel-Moty *et al.*, 1968; Abu-Damir *et al.*, 1983; Faye *et al.*, 1983; Ghosal and Shekhawat, 1992), respectively.

The normal range of Zn value in other ruminants has been reported as 70-120 mg/100 ml (Underwood, 1977). In healthy camels the minimum Zn value was 85.5 mg/100 ml (Ghosal and Shekhawat, 1992).

The objective of this study was to determine Zn levels in the blood sera of normal camels in Eastern Province of Saudi Arabia, together with the determination of total red cell counts in the collected blood samples.

### MATERIALS AND METHODS

Fifty camels of mixed breeds, sex and ages were sampled after antimortem examination. The blood samples were collected from jugular vein using vacutainer tubes without anticoagulant. Serum was separated by centrifugation, labeled and analyzed immediately or frozen at  $-20^{\circ}\text{C}$  until analyzed within two days. Concentrations of serum Zn were determined by atomic absorption spectrophotometry (Perkin, 1982). Samples for haematology (red cells counts) were collected aseptically and calculated by standard conventional methods.

### RESULTS AND DISCUSSION

All 50 camels were examined and no abnormal clinical signs were observed. The age, sex, Zn levels and Red cells counts are shown in Table 1. They were classified into three groups (G) as follow: G-1 comprised camels of age 5-7 years (Y), G-2 ranges 8-10 Y and G-3 over (>) 10 Y.

The camels slaughtered at Al-Ahsa abattoir were local and mixed breeds. The age of animals was ranged from 5 to 12 years, except that the females number was higher probably to their inefficient productivity at this period (Underwood, 1977). El-Kasmi (1989) reported that young camels showed lower Zn level than adults with no sex difference.

Zn levels in healthy and deficient camels are shown in Table 2 by various authors. The minimum Zn level which might be associated with clinical signs was recorded to be 41 mg/100 ml (Abdalla *et al.*, 1988)

Table 1: Age, sex, zinc level (mg/100 ml) and RBC counts ( $10^{12}/L$ ) in 50 camels at slaughter house in Saudi Arabia

NO.	G-1 (5-7 Y) n=17			G-2 (8-10 Y) n=26			G-3 (> 10 Y) n=7		
	Sex	Zn	RBC	Sex	Zn	RBC	Sex	Zn	RBC
1	F	80	8.0	F	132	6.5	F	127	5.2
2	"	87	6	"	98	5.5	"	85	5.7
3	"	87	9.5	"	110	5.0	"	87	7.2
4	"	107	6.5	"	83	5.0	"	90	6.2
5	"	96	5.2	"	83	7.2	"	130	9.5
6	"	77	5.5	"	80	7	"	97	8.5
7	"	90	9	"	90	9	M	77	8.5
8	"	83	7	"	87	7			
9	"	87	7.5	"	87	5.7			
10	"	83	6.5	"	83	6			
11	"	123	8	"	113	8.5			
12	"	117	6	"	123	7.5			
13	"	133	7.5	"	90	7			
14	"	127	7	"	80	7			
15	"	133	8.5	"	87	5.2			
16	M	97	6	"	87	7.5			
17	"	120	7.2	"	110	5.7			
18				"	120	9			
19				"	120	7.7			
20				"	117	9			
21				"	87	6.5			
22				"	100	7.5			
23				M	93	10			
24				"	127	8.5			
25				"	100	6.7			
26				"	87	8			
Average		101.6±19.8	7.09±1.23		99.00 ± 16.3	7.11 ± 1.34		99.00 ± 21.0	7.25 ± 1.62

whereas other low Zn level obtained by Faye *et al.* (1991) was 38.4 mg/100 ml. Indigestion caused by foreign bodies (Gameel *et al.*, 2000) probably cause misutilization of microcontents of the food. In experimental feed trial by Bengoumi *et al.* (1998) who reported that camels regulate their plasma Zn concentration at a very low level 40 mg/100 ml and their requirements are lower than that in cows.

The ingestion of sand by dromedary calves was investigated by Wernery and Kaddin (1995) who assumed that this may be related to undetected mineral deficiency of magnesium, phosphorous, calcium and iron but not for zinc.

In Eastern Province of Saudi Arabia, soil analysis revealed that the camels are grazed or kept on soils that contained Zn (Ali and Al-Noim, 1992) which may prevent Zn deficiency in such area. Diagnosis of Zn deficiency is based on low plasma concentration < 60 mg/100 ml in camels (Abdu-Damir, 1998). This probably has relation to some internal and external factors.

The red blood cell counts in the blood of the camels in this study ranged from 5 to  $9.5 \times 10^{12}/L$  being similar to the earlier report of Abd El-Samee (1990) who recorded  $7.1 \times 10^{12}/L$  as a minimum count.

The Zn levels of camels in this study ranged from 77-133 mg/100 ml and the mean ranged from 99.0 to 101.58 mg/100 ml. These results were similar as found by Faye *et al.* (1986). There was no significant correlation between red blood cell counts and different Zn levels and also with age and sex. Compared to other species, camel's red cell withstand lower ionic concentrations such as water loading being a highly desirable physiological asset in desert species (Perk, 1963).

Although the young camels (G-1) had shown higher Zn level than other two groups in this study but there was no correlation between sex and Zn levels.

It is suggested that further research is needed to analyze hard metallic objects and foreign bodies ingested by camels in relation to Zn contents. The present study showed that Zn level in the camels in the Saudi Arabia are within normal range.

**Table 2: Zn levels in normal and deficient camels as reported by different authors**

Normal Zn level	References
135	Abdek-Motry <i>et al.</i> (1968)
93.4±4.2	El-Tohamy <i>et al.</i> (1986), Faye <i>et al.</i> (1986)
107.3±3	El-Kasmi (1989)
85.4±2.5	Ghosal and Shekhawat (1992)
104.8±9.5	Abdu Damir <i>et al.</i> (1983)
Deficient Zn levels	
41	Abdalla <i>et al.</i> (1988)
46.2	Faye <i>et al.</i> (1990)
38.4	Faye <i>et al.</i> (1991)

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